THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The heavy import movement in steel and a further burst of activity in foundry iron are the features of the iron market for the week. The buying of steel in Germany and England now promises to grow to very considerable proportions, in spite of recent advances abroad. The independent sheet manufacturers at their meeting in Pittsburg last week decided to send a commissioner to England and Germany to buy sheet bars, and he is now on the way. The amount of the contracts as talked of will be about 40,000 tons, but it is believed a larger tonnage will be needed, deliveries extending over the next six months. It is understood that the United States Steel Corporation has been a buyer in a small way, 10,000 to 15,000 tons having been taken, with more under negotiation. The steel corporation is also a buyer abroad of steel melting scrap, and the importation of low phosphorus scrap by open-hearth plants is likely to reach a round tonnage before the end of the year. German steel has advanced $4 to $5 since December and German billets are now quoted $31.50, Pittsburg, while $33 is asked for sheet bars. It is believed from 150,000 to 200,000 tons of foreign steel will be needed this year to supplement the domestic output. Plants under construction and plans on foot will give a very considerable increase in our open-hearth capacity, but only a minor portion of it will be available this year. In the foundry iron market the feeling that has been growing for some weeks among consumers gave evidence of added excitement in the past week, and the business closed has been very heavy. This has been almost entirely for delivery in the second half of the year. Many buyers are influenced by the difficulty of getting iron already ordered and the practical impossibility of finding even carload lots of foundry iron for delivery before July 1. They seem to feel that this condition will be encountered in the second half, though it is well understood that furnace output will be greater as time passes, also that railroad troubles will disappear to a large extent. A variation of fully $1 a ton appears in current transactions. Those producers who are exerting themselves most to hold down prices are evidently not taking all the business offered them, since other sellers are getting top prices from the same buyers. Among Southern makers the two largest interests are maintaining $12 for No. 2, but sales have been made as high as $13 by others. Pipe works are finding great difficulty in getting the lower grades, and the supply of gray forge is short. Importations of pig iron will scarcely be a considerable factor in the market. Prices in England have advanced and Middlesboro iron cannot be landed at Philadelphia or New York short of $17 after the $4 duty is paid. German shipments of steel into England have been checked by the advance in German markets and the situation in both countries has improved greatly under the American demand and the certainty that for this year any attack from this side need not be expected. The demand for basic pig iron in the Central West is strong. A Shenango Valley furnace has sold its output for 18 months to a basic steel plant in the same valley, and the United States Steel Corporation has bought 25,000 tons of Virginia basic at $17.50, Pittsburg. Forge iron has sold at $16.50, Pittsburg, and Bessemer at $16.75 and $17 at Valley furnace, delivery in the second half. The finished material market is increasingly strong. The structural material situation is not likely to be relieved by imports, as the duty of $10 a ton added to the advanced prices abroad brings seaboard delivery up to $43. However, there are German and English mills prepared to roll American sections at a price. There is continued good buying of bars and while no official change from the 1.50c basis, Pittsburg, for Bessemer bars has been made, shipments in less than 50-ton lots bring 1.60c. The cost of steel apart from other considerations will sustain the sheet market. Contrary to expectations, sheet mills have not been able to accumulate any stocks in the winter months.

LATER.—We are informed that a Pittsburg district concern is negotiating for 35,000 tons of foreign billets for delivery between May 1 and the end of the year. Foreign billets have advanced further and are now quoted $32.75, Pittsburg. The German market is responding by bounds to the stimulus from this side. The inquiry mentioned above, together with those of the sheet manufacturers, the steel corporation and others, makes about 100,000 tons of steel about to be placed abroad.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, Feb 26.

The steel scarcity grows more acute daily and the importation of billets and sheet bars by large interests is now assured. Contracts for the importation of steel billets for Eastern delivery amounting to 15,000 tons were placed during the week and an additional large tonnage is being considered by a number of interests. Further advances have been made by German steel producers on both billets and sheet bars and ruling quotations are $31.50 for 4 x 4 billets, Pittsburg, and nearly $33 per ton for sheet bars. The independent sheet manufacturers at their meeting last week decided to send a commissioner abroad to purchase both billets and sheet bars amounting to about 40,000 tons. The commissioner is scheduled to sail this week. Owing to the large tonnage to be purchased it is believed that a somewhat better price can be secured than quoted above. It is reported on excellent authority that the leading steel interest is 150,000 tons behind on deliveries of steel billets and sheet bars to outside consumers and allied interests. There is little indication that this tonnage can be caught up within the next six months owing to the operation of all the finishing mills at their utmost capacity. That the foreign market must be drawn upon, even much more heavily than has been the case in the past few months is already apparent to the largest steel interests and the steel must be imported even at the advanced prices.

Should the finishing mills continue to operate at their present capacity for another year, the increase in the open-hearth steel production now under way and projected, will no doubt ease up conditions to a large extent as the total open-hearth steel producing capacity will be increased no less than 1,500,000 tons per year during the next 12 or 15 months.

Consumers of structural material will also suffer if some relief cannot be afforded by the foreign markets, as domestic mills are practically turning down all business offered for de-

livery within the next six or seven months. The heavy duty on structural material added to the present prices abroad almost precludes the bringing the material into this country, except in cases of the greatest necessity.

The pig iron market continues excited, with a tendency toward still higher prices. One of the largest transactions of the week was the purchase of the output of the Shenango Valley furnace by the Sharon Steel Co. for the next 18 months. The contract calls for the delivery of 6,000 tons of iron per month or 108,000 tons in all. By this contract the Sharon Steel Co. will be amply supplied with basic iron for its open-hearth plant, together with the product of its own furnace, until its two new furnaces are completed and in operation. We also note the sale of 25,000 tons of Southern basic to the United States Steel Corporation at $17.50 Pittsburg.

Owing to the great demand for old material for open-hearth purposes, good remelting stock has advanced in price enormously during the past two weeks. Good low phosphorus stock is extremely scarce and there is every indication of still higher prices.

PIG IRON.—The largest transaction announced in the week was the sale of the entire output of the Ella blast furnace at West Middlesex, Pa., for the next 18 months to the Sharon Steel Co., of Sharon, Pa. The transaction involves fully 100,000 tons of basic iron, and the price, it is understood, will be governed by that asked in the open market. While several Northern furnaces having basic for the third and fourth quarters are asking $17 and $17.25 at the furnace, we note the sale of 25,000 tons for delivery of the United States Steel Corporation for the third quarter at $17.50 delivered. This iron will be furnished by Virginia furnaces. Large consumers of Bessemer iron are now pretty well covered for the third quarter of the year, the last sales being made on a basis of $16.75, Valley furnace. Several furnaces that have their output for the second half of the year practically unsold are asking $17 at furnaces, and we note sales of one 5,000-ton and one 3,000-ton lot at this price for delivery through the year. The situation in forge iron is extremely strong, and a number of large local consumers have made inquiry for iron for delivery during the months of March, April, May and June, but up to the present have been unable to secure the tonnage required. Two of these consumers are in the market for 3,000 tons each. While the Southern furnaces are in position to make sales of foundry iron, promising fair deliveries, they cannot make shipments on forge short of September. Few of the Northern furnaces can make deliveries on forge before June or July and it is altogether probable that the forge iron consumers will be compelled to purchase the lower grades of foundry iron to meet their wants. We note one sale of forge iron, amounting to 1,000 tons for delivery during the next three months, the latter part of last week at $16.50, Pittsburg. This was a low price, as furnaces are asking this price and as high as $16.50, Pittsburg, for delivery in the third quarter. No. 2 foundry iron for delivery throughout the second half of the year has been sold during the week at $17.25, Pittsburg, while iron for delivery through the second quarter alone has sold at $17.50 to $17.75. We note the sale of one 2,000-ton lot at this latter figure. The tonnage closed for second half delivery is estimated at 12,000 tons. Carload lots for prompt shipment have sold as high as $18 and $18.25 per ton. Some Southern foundry, No. 2, for delivery the second and third quarters has been sold at $16.15, Pittsburg. We note the sale of 1,000 tons of this price. Other Southern interests have sold small lots of iron for delivery during the next two and three months at $16.65 and $16.90, respectively It is apparent from the prices paid, that consumers will pay the furnace asking price, providing the proper shipment is assured. During the last week the operation of the Valley furnaces has improved, the coke shipments this week having been much better than for some time. We revise quotations as follows:

Bessemer, Valley	$16 50 to	17 00
Bessemer, Pittsburg	17 25 to	17 75
No. 1 Foundry	18 00 to	18 50
No. 2 Foundry	17 25 to	17 75
No. 3 Foundry	16 50 to	17 00
Gray Forge, Pittsburg	16 50 to	16 75
Chilled Basic, Valley	16 50 to	16 75
Chilled Basic, Pittsburg	17 25 to	17 50

STEEL.—The steel situation continues acute and there have been further orders placed for steel billets for Eastern shipment amounting to about 15,000 tons. These will be imported from Germany at a price equivalent to about $31.50, Pittsburg. The German market has again slightly advanced during the week and it is doubtful if German sheet bars can be delivered at Pittsburg for less than $32.50 to $33 per ton. It is reliably reported that the leading interest is fully 150,000 tons behind on deliveries of billets and sheet bars to its various finishing mills and outside interests and will no doubt be compelled to import steel from abroad. At the meeting of the independent sheet manufacturers held in this city last week it was decided to send a commissioner abroad to import about 40,000 tons of sheet bars. He has been commissioned to visit both English and German steel manufacturers and will endeavor to bring the steel to this country at a price equivalent to $31 Pittsburg. This may be done in view of the fact that the order is very large, and shipments are extended over a six months period. That there will be relief at home within a year, when the open-hearth plants under construction and projected are in operation is certain. While any considerable tonnage of domestic steel cannot be secured for prompt delivery we note the sale of several carloads of 4 x 4 billets at $31.75, Pittsburg.

FERRO-MANGANESE.—Ferro-manganese continues unchanged at $52.50 per ton for domestic at buyer's mill in carload lots. Foreign manganese is held at $50 per ton.

SPELTER.—The spelter market is somewhat firmer and prime Western grades are held at 4.12½c to 4.15c, Pittsburg.

MUCK BAR.—The muck bar market is strong with a fair demand. While the largest producer is holding neutral muck at $30 per ton we note the sale of a 200-ton lot at $31.

SKELP.—The demand for both grooved and sheared skelp continues fair at unchanged prices. We quote grooved steel skelp at 1.70c, and sheared at 1.75c, and iron skelp, grooved and sheared at 1.80c and 1.85c, respectively.

RAILS AND TRACK MATERIAL.—Rail mills continue to operate in full on orders placed some time ago, and quotations remain unchanged as follows: Standard sections, 50 pounds and over, in lots of 200 tons and over, $28; car lots and less than 200 tons, $30; less than car lots, $32; light rails, 8 pounds, $42; 12 pounds, $38; 16 pounds, $35; 20 pounds, $35; 20 pounds, $34; 25 to 40 pounds, $32. Track material: Spikes, 2c to 2.05c; track bolts, square heads, 2.50c; hexagon heads, 2.65c; fish plates, 1.60c.

PLATES.—The plate market continues unchanged. A fair tonnage continues to be placed but only a few of the mills have more than a few weeks' orders on their books. Prices remain as follows: Tank plate, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plates more than 100 inches wide, 5 cents extra 100 pounds. Plates 3-16 of an inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5 cents extra a hundred pounds for less than carload lots. Terms, net cash in 30 days.

PIPES AND TUBES.—Never in the history of the trade have January and February been as productive of new business as have the past two months. The tonnage booked by the leading producer during this period is double that of any similar period in previous years. The concessions that are being offered by the independent mills are not affecting the quotations of the National Tube Co. Discounts to consumers in carload lots, Pittsburg, remain unchanged as follows:

MERCHANT PIPE.

	Blk. Per cent.	Galvd. Per cent.
⅛ to ⅜ and 11 to 12 inches	61	48
½ to 10 inches	68½	56

BOILER TUBES.

Steel.

	Per cent.
1 to 1¾ inches	47½
2¼ to 5 inches	65¾
1¾ to 2¼ and 6 to 13 inches	60

Iron.

	Per cent.
1 to 1¾ and 2½ inches	43½
1¾ to 2¼ inches	43
2¾ to 13 inches	53

CASING.

	S. and S. Per cent.
2 to 3 inches	58
3¼ to 4 inches	63
4¼ to 12¾ inches	65

BARS.—A fair amount of new business continues to be offered in steel bars and the mills are unable to make deliveries in less than 90 days on any new business that is being offered

them. The steel bar manufacturers make the following schedule of prices on small lots: On lots of one size of either Bessemer or open-hearth, aggregating 1,000 pounds to 1,999 pounds inclusive an advance of 5 cents per 100 pounds is made; one size aggregating over 500 pounds to 999 pounds inclusive, an advance of 15 cents per 100 pounds; one-size lots aggregating 500 pounds or less an advance of 25 cents per 100 pounds. These advances are in addition to the half extras charged. Our regular quotations follow: Iron bars, 1.60c, Pittsburg, with full freight added to point of delivery; refined iron bars, 1.75c and upwards; Bessemer steel bars, 1.50c; open-hearth, 1.60c; plow beams and cultivator beams, 1.50c, net; channels, angles, zees and tees, Bessemer under three inches, 1.60c; over 3 inches, 1.70c. Hoops and bands are quoted at 1.90c, full extras. For Bessemer steel bars in lots less than 50 tons, 1.60c is generally asked.

Sheets.—While independent producers are reported to be cutting prices in some sections of the country, in this district they are able to secure from $2 to $3 per ton above the prices quoted by the American Sheet Steel Co. for prompt shipment. A large amount of business is being offered and the only sign of weakness in the entire market is on galvanized sheets. Our quotations follow: Nos. 10 and 12, 2.40c to 2.50c; 14 and 15, 2.50c to 2.60c; 16, 2.60c; 18 and 20, 2.70c to 2.80c; 22 and 24, 2.80c to 2.90c; 26, 2.90c to 3c; 27, 3c to 3.10c; 28, 3.10c to 3.20c; 29, 3.25c to 3.35c; 30, 3.35c to 3.45c. Galvanized sheets are quoted at 70 and 5, and 75 off in carload lots; less than carload lots, 70 and 10 and 5 off.

Structural Material.—The structural mills are doing everything in their power to satisfy the consumers of structural material, but so large is the tonnage offered that much of the business is being refused owing to the fact that deliveries cannot be made satisfactory. Fabricators and erecting firms, under contract to complete buildings within a specified time are considering the advisability of importing structural material, but it is doubtful if this will be done owing to the high cost of the material delivered in New York. Adding to the ruling quotations in England the duty of $10 per net ton brings the cost up to about $43, seaboard. Several concerns in England are in position to roll the American shapes, being forced several years ago to adopt the Carnegie standards owing to the competition in India. One concern in Germany is also in position to roll American shapes, having prepared rolls for this purpose a number of years ago when there was some possibility of delivering German shapes in this country. Quotations remain unchanged as follows: Beams and channels, 3 to 15 inches, 1.60; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 6 inches, 1.60c; universal mill plates, 1.60c.

Wire and Wire Nails.—Considerable new business is being placed in both wire and wire nails and jobbers are laying in stocks to supply the spring demand. Quotations remain unchanged as follows: Wire nails in carload lots, $2.05 per keg; smaller lots, $2.10 and $2.15; plain wire, $2 in carload lots and $2.10 in less than carload lots to retailers; galvanized wire $2.40 in carload lots; polished staples $2.20 and galvanized staples $2.60; painted barb wire $2.60 and galvanized $2.90. These prices are quoted on a Pittsburg base plus the actual freight to destination. Cut nails are held at $1.95 in carload lots and $2 in less than carload lots, Pittsburg, plus freight to destination.

Merchant Steel.—Producers of tool steel report a large amount of business booked, in some instances extending throughout the entire year. Quotations are unchanged as follows: Turned, cold rolled and ground shafting in carload lots 55 off, and in less than carload lots 50 off: tire steel, 1.70c in carload lots and 1.80c less than carload lots; toe calk 2.05c to 2.15c; sleigh shoe, 2c to 2.25c; machinery steel, 1.50c; smooth machinery steel, 1.75c. Tool steel, 7 cents and upwards.

Old Material.—Low phosphorus open-hearth material continues to command fancy prices, one sale of good low phosphorus stock, amounting to 500 tons having been made during the week at $21, at local mill. Iron rails are also commanding fancy prices, one 200-ton lot having been sold at $23.50 per ton. Rerolling rails are held at $23.50 per ton. Our quotations, gross tons, are as follows: Heavy melting stock, $17.50 to $17.75; steel rails, $17 to $17.25; busheling scrap, $13.50 to $14; No. 1 wrought, $18 to $18.50; iron rails, $23 to $24; cast borings, $9 to $9.25; cast scrap, $15.75 to $16.

Coke.—The Connellsville *Courier* estimates the production of the Connellsville region for the week ending Saturday, Feb. 15, at 212,183 tons as compared with 210,819 tons of the previous week. Furnace coke for prompt shipments commands from $3 to $3.25 per ton, while on running contracts $2.25 per ton is quoted. Foundry coke is held at $2.75 per ton. Outside coke is held at 25 cents per ton less than the above.

CHICAGO.

Office of *The Iron Trade Review*,
634 Monadnock Block, Feb 25.

Though the buying of pig iron in the past week has been of large proportions, the actual tonnage sold does not reflect the condition of the market in this city. The inquiry has been tremendous, and if sellers had desired they could have booked double the tonnage that was taken. As a result of the shortage of iron, the growing scarcity of coke, which means further decreased production, consumers became alarmed as to the inability to procure future deliveries, and a feeling almost amounting to a panic resulted. A number of manufacturers, however, to allay this feeling, are refusing to take orders for delivery in the last half from those whose custom it is not to buy at the present time, and are assuring all buyers that there is no need for alarm at the present state of the market, as there will be plenty of iron to go around. Sales, however, for the last six months of the year are very active, and there is a strong demand for all kinds of iron from all parts of the territory tributary to this market. There is no improvement in the shipments of coke, and the supply has fallen off again to a minimum. This shortage has caused the Mayville furnace to bank.

Buying in bars has fallen off some, though the inquiry is as heavy as before. While one local mill has no iron for sale for shipment before August, other producers report they are not taking on new business for delivery in the last half until the pig iron and scrap situation for that period assumes more definite shape. In other lines of finished material the strong demand continues. One Eastern manufacturer of structural steel has announced that it will sell no more material for delivery in 1902. Standard sections of rails cannot be had inside of ten months' delivery, nor light rails short of three months. Toe-calk steel has been advanced to a minimum of 2.25c for large lots, with corresponding increase for smaller orders. An Eastern maker of merchant steel has withdrawn from the local market, announcing that it will sell no material to any but its regular customers.

Pig Iron.—There came very near being a repetition of the panicky experiences of 1899 last week, and had not sellers generally assured buyers that there was no cause for alarm the market undoubtedly would have got away from them. For several months there has been a gradual tendency toward the situation as it is at present, and the movement reached its culmination last week. Consumers, growing alarmed as to the ability of getting iron for delivery in the last six months of the year, have been placing contracts covering this period and in the last ten days there has been an unprecedented number making inquiries and contracting for future needs. The bulk of this business has been taken by Southern furnaces and conservative estimates place it at nearly 100,000 tons. Sellers, however, are endeavoring, as far as is in their power, to allay this feeling of alarm, and some are even refusing to take orders from those who do not usually buy at this time of the year. The coke situation has not improved any, and the Mayville furnace has been compelled to bank, as a result of the shortage. This is offset, however, by the blowing in of the idle furnace at the Union Works on Saturday on Bessemer iron. The other Union furnaces changed from Bessemer to speigel. There has been no formal advance made in the price of Southern iron, as was thought probable a week ago. We have revised some prices in the following quotations:

Lake Sup. Charcoal	$20 00	to $21 00	Southern Coke No. 4,	14 65	to $14 90
Local Coke Fdy. No.1	17 50	to 18 00	Southern No. 1 Soft	$16 15	to 16 40
Local Coke Fdy. No.2	17 50	to 18 00	Southern No. 2 Soft	15 55	to 15 90
Local Coke Fdy. No.3	16 50	to 17 00	Southern Gray Forge	14 65	to 14 90
Local Scotch Fdy. No.1	18 50	to 19 00	Southern Silveries	16 65	to 17 65
Local Scotch Fdy. No.2	18 00	to 18 50	Jackson Co. Silveries	18 00	to 18 50
Southern Coke No. 1	16 40	to 16 65	Ohio Strong Softeners	18 50	to 19 00
Southern Coke No. 2	15 65	to 15 90	Alabama Car Wheel	20 50	to 21 00
Southern Coke No. 3	15 15	to 15 40	Malleable Bessemer	18 50	to 19 00

BARS.—Very little new business is being placed, though the inquiry for future delivery and specifications against old contracts are both heavy. Some of the independent mills are declining to accept contracts for the last half on account of the present high prices of scrap and pig iron, and are holding off buyers as much as possible until the price of these materials for the last six months assumes a more stable basis. All the mills are sold up for periods varying from two to four months, and one as far as August. We quote 1.75c to 1.85c for iron, Chicago; steel, 1.65c to 1.75c; out of store, 2c.

SHEETS.—Jobbers report that sales are not active and that there is no improvement on the shipments from mills. Independent manufacturers report that business is of good proportions and that the outlook is promising. We quote No. 27 black from store, 3.30c to 3.40c, and galvanized 70 per cent to 70 and 5 per cent.

STRUCTURAL STEEL.—Manufacturers of this material are sold further ahead than in any other branch of the trade, and there is difficulty in placing new business for delivery in 1902. One Eastern concern has supplemented the order it sent to its local office some weeks ago to sell no more material for delivery within six months, by an order to withdraw from the market for the balance of the year. The scarcity will seriously curtail building operations in this city, many new enterprises having been put under way in the last few weeks. We quote mill shipments, carload lots, as follows: Beams, 15 inches and under, 1.75c; 18 inches and over, 1.85c; angles, 6x6 and under, 1.75c; over 6x6, 1.85c; plates, 1.75c; base, tees, 1.80c; zees, 1.75c; lots from store, angles, 2.10c, minimum; tees, 2.15c, minimum; beams and channels, 2¼ cents per pound, minimum.

RAILS AND TRACK SUPPLIES.—Standard section rails cannot be bought in this market within ten months' delivery and light rails within three months. Parties who have franchises requiring spring delivery of rails have been forced to buy relaying rails and in some cases have had to accept material scarcely fit to go into the track, and pay prices higher than the cost of new rails. Track supplies are in good demand, but manufacturers generally are sold for two and three months ahead. We quote as follows: Standard rails, $28; light sections, $34 to $36, according to size; out of store, $40 to $44; splice bars, 1.70c to 1.80c; spikes, 2.10c; track bolts and hexagon nuts, 2.80c to 2.90c, out of store, 2.90c to 3c; square nuts, base, 2.65c to 2.75c; out of store, 2.75c to 2.85c.

MERCHANT STEEL.—Toe calk steel has been advanced to 2.25c minimum figure for large contracts, with regular advances for smaller quantities. There is a heavy inquiry, but mills are not soliciting new trade. We quote mill shipments, Chicago delivery, as follows: Smooth finished tire steel, 1.95c to 2c, which can be shaded on carload lots; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe, 1.65c to 1.80c, flat sizes; concave and convex, 2c; cutter shoe, 2.40c to 2.60c; machinery steel, 2.15c to 2.25c, base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.25c to 2.35c; out of stock, 2.40c to 2.60c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots, 5 per cent to 10 per cent higher; cold rolled shafting, carload lots, 55c off, Chicago; less than carload lots, 50 per cent off, Chicago.

BILLETS.—A few inquiries for billets are reported, but as mills have none for sale these were withdrawn. We quote Bessemer billets, $31 to $33; open-hearth, $33 to $35.

PLATES.—There is little new business, though specifications against contracts are heavier than for some weeks. The local mill is well supplied with orders. We quote, as follows: Tank steel, base, ¼-inch, 1.75c to 1.85c; flange steel, 1.90c to 2c; marine steel, 1.95c to 2.10c; firebox steel, ordinary, 2c to 2.10c; special, 2.25c and upward. Jobbers are selling from store according to size as follows: Tank steel, 1.90c to 2c; flange steel, 2.10c to 2.25c; marine steel, 2.40c to $2.50c; firebox steel, ordinary, 2.40c to 2.50c; special, 2.50c and upward.

CAST IRON PIPE.—As spring advances, buying improves, though at the present time it is limited almost entirely to small orders. The inquiry is good, and the indications point to an excellent spring trade. Prices are firm as follows: 4-inch water pipe, $29, carload lots, f. o. b. Chicago; 6-inch water pipe, $28; 8-inch and larger sizes, $27; gas pipe, $1.00 per ton higher than above prices.

MERCHANT PIPE.—Mills report they are in excellent shape to make prompt deliveries. New business is still confined to small lots, and no heavy buying movement is expected for several weeks. Our quotations follow:

MERCHANT PIPE, RANDOM LENGTHS.

	Black Per cent.	Galv. Per cent.
⅛ to ⅜ and 11 to 12 in	59.5	46.5
½ to 10 inches	67	54.5

BOILER TUBES.

	Steel Per cent.	Iron Per Cent.
1 to 1¼ in	40	35
1¼ to 2¼ in	47½	37½
2¼ to 5 in	57½	47½
6 in. and larger	45	40

WIRE AND WIRE NAILS.—The volume of new business keeps up and the entire capacity of the mills of the local concern is taken to meet its orders. Jobbers in all parts of the West report every indication for a heavy spring trade, and are endeavoring to stock their warehouses. We quote as follows: Smooth wire, carload lots, $2.15; painted barb wire, $2.75; galvanized barb wire, in carload lots, $3.05; wire nails, carload lots, $2.20; staples, carload lots, $2.30; jobbers' prices to retailers, 10 cents higher than above for carload lots, and 20 cents for less than carloads.

COKE.—Receipts have fallen to a very low figure and there is some uneasiness that this market will experience a repetition of the conditions that existed several weeks ago. A number of furnaces are receiving only enough coke to keep them in blast from day to day. Spot coke sells from $6.25 to $6.50.

OLD MATERIAL.—Dealers report there is a scarcity of material, and many of them are hard pressed to fill their orders. Mills are buying pretty near all they can get, and are paying the present high prices. We have advanced some of our prices, and quote as follows:

Old iron rails	$21 50 to $22 50	Relaying rails	27 00 to 28 00
Old steel rails, 5 ft. and up	22 50 to 23 00	Old wheels	$17 00 to $17 50
Old steel rails, mixed	14 50 to 15 00	Heavy melting steel	14 50 to 15 00
		Mixed country steel	11 00 to 11 50

The following are selling prices per net ton:

No. 1 R. R. wrought	$16 50 to $17 50	Steel Axles	$18 50 to $19 00
No. 2 R. R. wrought	16 00 to 16 50	Cast borings	6 50 to 7 00
Dealers' forge	14 00 to 15 00	Wrought turnings	11 50 to 12 00
No. 1 busheling	12 50 to 13 00	Iron axle turnings	12 50 to 13 00
No. 1 R. R. & mach. cst.	12 25 to 12 00	Steel axle turnings	12 00 to 12 50
Railway malleable	13 00 to 14 00	Stove plates	10 00 to 10 50
Country malleable	11 50 to 12 00	Old iron splice bars	18 00 to 18 50
Iron axles	22 00 to 22 50		

CLEVELAND

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, Feb. 26.

The lake freight market has shown further activity in the past week. No ore charters at 75 cents from the head of the lake have been made, and the United States Steel Corporation has not made any contracts so far as reported. Upwards of 4,000,000 tons of ore is believed to be covered on season or Nov. 20 contracts, at 80 cents from Duluth, 70 cents from Marquette and 60 cents from Escanaba. The indications from ore purchases are that Bessemer iron will be made at Valley furnaces in the next year in larger tonnage than ever, that there will be little or no addition to the output of basic iron, and that the output of foundry iron in the Mahoning and Shenango valleys will be less than in the past three years.

Recent deals in Lake Superior ore properties point to the thoroughness with which exploration and development have been carried on on the Mesabi range in the past year, and the fact that the United States Steel Corporation is not competing with independent steel producers for Mesabi properties. On the old ranges the steel corporation is actively in the market for all properties of value. Its action in closing for 640 acres of silicious ore lands on the Cascade range shows a long look ahead to the time when old range Bessemer ores will be in much less plentiful supply and when those high in silica will be needed in increasing quantities because of the high percentages of the low-silica Mesabi ores that must then be used.

PIG IRON.—There is a variation of at least $1 a ton in prices paid for iron. Valley furnaces have prices ranging from $16 to $17 in the Valley for No. 2 foundry iron, delivery in either case in the second half. It is evident that some foundrymen, particularly those who buy frequently and in small lots are going to be short of iron in the second quarter. Scouring the market occasionally brings out a carload for early shipment, but most sellers are absolutely sold up to the middle of the year. In the past week 12,000 to 15,000 tons of foundry iron have been sold in this market for delivery in the second half.

Much of it was Southern and Southern Ohio iron. Those Valley furnaces that still sell at $16 for No. 2 only offer small lots, so that their policy is rather calculated to affect sentiment than to actually supply the demand. Where a foundryman buys on this basis he must turn round and engage a much larger quantity at from 50 cents to $1 a ton higher so as to get the supply he wants. A good deal of the buying for the second half is to make sure of desired brands; so far as the aggregate is concerned it is not yet believed that any scarcity will develop in the second half. Offers are being made for off-Bessemer iron at a price higher than the contract basis for Bessemer. Gray forge is in demand at $15.75 to $16 at furnace. For pipe works Nos. 3 and 4 are being sought without much success, the furnaces turning out relatively little low grade iron. We quote the Cleveland market as follows:

Bessemer	$16 75 to $17 50	Scotch No. 1	$17 25 to $17 75
No. 1 Strong F'dry	17 25 to 17 75	Scotch No. 2	16 75 to 17 75
No. 2 Strong F'dry	16 75 to 17 25	Gray forge, Valley	15 75 to 16 00
No. 3 Foundry	16 50 to 16 75	LakeSuperior charc'l	20 00 to 21 00

FINISHED MATERIAL.—There has been good buying of bars in this market, contracts of the past two weeks amounting to between 15,000 and 20,000 tons. Steel bars without any official action by the manufacturers party to the agreement are coming to the level of bar iron. On lots of less than 50 tons the Pittsburg price is generally 1.60c, though 1.50c Pittsburg is still the basis on good sized contracts. For bars out of store Cleveland the market is now 1.85c to 1.90c, the former price applying on larger orders and those from dealers. The situation as to structural material is increasingly strong. Delivery in August is the best that can be secured from mill, and in one case no further orders can be taken for this year. The Cleveland price for mill shipments is still 1.70c for beams and channels up to 15 inches, but 2½c to 3c is charged for small lots out of stock. The scarcity of angles 3 to 6 inches is still a feature, and where any stock can be found orders are placed often coming from remote territory. Plate mills are making deliveries within three or four weeks, and some of them have 60 days' business on their books. There is no special activity in new business. The sheet mills have been unable to accumulate stock for the Spring demand in the way they had expected, and it looks as if all the capacity would be required to take care of current orders when the outdoor season opens. The manufacturers of galvanized continue to make concessions here and there, generally to the extent of quoting the Pittsburg price as a delivered price where a 4 or 5 cent freight is involved. We quote on mill shipments to consumers, Cleveland deliveries, as follows: No. 24, 2.90c to 3c; No. 26, 3c to 3.10c; No. 27, 3.10c to 3.20c, with usual extras for less than carload lots, etc. Quotations from store are as follows, prices depending on quantity and delivery; No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.55c to 2.70c; No. 16, 2.95c to 3.10c; No. 18, 3c to 3.15c; No. 20, 3.05c to 3.20c; Nos. 22-24, 3.15c to 3.30c; Nos. 25-26, 3.25c to 3.40c; No. 27, 3.35c to 3.50c; No. 28, 3.45c to 3.60c. The above are for one pass through cold rolls. For full cold rolled the extra is .10c. Galvanized sheets are quoted 70 to 70 and 10 off list.

OLD MATERIAL.—The firm tone of the market for two weeks past continues and dealers have advanced quotations. The general scarcity of material is embarrassing to buyer and seller alike. In addition to our regular list we note that uncut wrought iron boilers are quoted at $10, and pipes and flues at $15 to $15.50; both in gross tons. The following are revised current prices, all in gross tons:

Old steel rails, rolling mill lengths	$17 50 to 19 00
Old steel rails, short lengths	16 00 to 17 00
Iron rails	22 00 to 23 00
No. 1. railroad wrought	18 00 to 19 50
Mill scrap	15 50 to 17 00
No. 1. machine scrap	14 75 to 15 25
Machine shop turnings	13 00 to 13 50
Cast borings	7 50 to 8 50
Grate bars	9 00 to 10 00
Sheet iron	9 50 to 11 00
Stove plate	10 00 to 11 00
Car wheels	16 00 to 17 00
Heavy steel scrap	16 50 to 17 00
Iron axles	26 00 to 26 50

CINCINNATI.

Feb. 26.

The iron trade is in an anomalous condition. In both pig iron and finished material the demand is greater than the supply, yet the prices remain at the same figures that have ruled for some weeks. Of course, orders are being taken and it might be said in one way that the demand is not so great but there is iron and finished material offered to meet it; yet deliveries promised are so far in the future that it can scarcely be said with truth that the supply is adequate.

Deliveries are now promised so far ahead that consumers are beginning to ask themselves whether they are not being called upon to discount the future in a larger measure than they ought in giving contracts for material that they will get only after waiting the better part of a year. Some are expressing themselves as willing, if it were possible, to pay a higher price for their needs and get the stuff in a shorter time, rather than engage the material at quoted prices and wait many months on it. In a word they are beginning to wonder why the prices are not advanced and are face to face with a new problem in trade which does away with the rule of supply and demand, or at least attempts to do so.

It is apparently the policy of the large producing interests to keep prices at a stable figure, it being the belief that in this way the booms and depressions that are in the end disastrous to producer and consumer alike can be avoided. The policy may work out all right, but in the mean time the buyers of pig iron and finished material are chafing a little. The danger to the successful carrying out of the policy, it is believed, will be found to be that competition will be invited by such long deliveries just the same as by too high prices. However, talk of additional capacity in iron and steel and production of finished material, that could have any effect on this situation, is considered by many as idle.

Southern furnaces are selling at all kinds of prices, but the larger interests are holding to $12 for No. 2 foundry at Birmingham in spite of the fact that they are sold ahead for the better part of the year.

PIG IRON.—The buying of pig iron goes right along, but orders are being placed only for iron to be delivered along the latter part of the year. The inside price is still $12 for No. 2 foundry Birmingham, yet there is iron selling at a considerably higher figure than this, especially if it is for delivery short of the latter half of the year. It must not be understood that iron is not selling at the lower price. One large firm sold in two days 30,000 tons of Southern foundry iron on that basis this week, and the deliveries are for the period beginning about the middle of the year. The attempt to keep prices from soaring is apparently successful, and no advance on Southern irons is predicted—that is, no general advance; yet iron is being sold by some interests at higher figures. There is a range of $1 in the prices on Southern foundry irons and it is claimed by some that they could get even higher prices.

One furnace in the South was offered a large contract this week for No. 2 foundry at $12.50. It refused the offer and made a counter offer of $13 deliverable August to October, saying that this was making a concession from what had been decided upon. This indicates the peculiar situation in which the trade finds itself. It is not doubted that the effort of the large companies in the South to check undue excitement in the trade will have its effect and that in a short time the conditions will become normal. There is a large tonnage of foundry iron unsold for the last half of the year, though for the first half it is thought that buyers are pretty nearly all covered. There has been a good demand in the East for Southern charcoal iron. Prices at Cincinnati, showing the wide range are as follows:

Southern Fdy. No. 1	$15 25 to $16 25	Gray Forge	$13 75 to $14 75
" " 2	14 75 to 15 75	Northern Fdy. No. 1	17 85 to 18 35
" " 3	14 25 to 15 25	" " 2	17 35 to 17 85
" " 4	13 75 to 14 75	Southern C.W. iron	19 50 to 20 00
So. Fdy. No. 1 soft	15 25 to 16 25	Malleable coke iron	17 60 to 18 10
So. Fdy. No. 2 soft	14 75 to 15 75		

FINISHED MATERIAL.—Buying has been very good in this district, and there is no reason to look for a cessation of the heavy demand. Prices remain unchanged and this encourages buyers to get their wants covered. The larger part of the buying, however, is for use in the immediate future and the long deliveries are causing a good deal of growling. There has been some talk that prices would be advanced in a few days, and if this were done it would simply be making the premiums now paid part of the regular market price. Many buyers are paying now more than the probable advance would be. There has been some talk of an independent mill in this district but nothing definite has come from it as yet. It is realized that it would take a mill a considerable length of time to get into shape to run if it were to be started from the ground up, and as there are no old idle plants that might be

utilized it is an uncertain undertaking to get into a venture of this kind.

Added to the long deliveries is the slowness of transportation companies in getting freight to destination. One iron store has had a car of material on the road since January 25, and another since January 29. Prices remain at 1.72c for bar iron at Cincinnati, and 1.62c for bar steel. Both are 2c out of store. Angles are 2c; plates, 1.85c; sheets, No. 28, 3.35 to 3.40c; No. 12 blue annealed, 2.35c.

OLD MATERIAL.—In the scrap market there has been a good demand and prices have been firm and even a little stiffer. The following are about the prices quoted:

Old No 1. Wrought Railroad, net tons	$ 16 00 to 16 50
Cast Machine and Foundry, net tons	12 50 to 12 75
Old Iron Rails, gross tons	21 50 to 22 00
Old Steel Rails, gross tons	18 00 to 18 25
Old Short Lengths, gross tons	15 00 to 15 25
Old Iron Axles, gross tons	21 00 to 21 50
Old Iron Car Wheels, gross tons	16 00 to 16 50
Stove Plates, gross tons	9 75 to 10 00
Wrought Turnings, net tons	11 50 to 11 75
Cast Borings, net tons	5 50 to 6 00

PHILADELPHIA.

Feb. 25.

The scarcity of iron for spot delivery continues to be responsible for the excited condition of the market. If customers could be guaranteed sufficient material to keep in operation for the next two months it is conceded that they would have no need to worry much over later deliveries. However, finding themselves short of iron for the immediate future many are showing a disposition to make what they consider better provision for the future, forgetting that the present stringency will likely disappear when the railroads have a chance to use their equipment to full advantage and without hindrance of unfavorable weather. The leading producers, particularly the largest Southern interest, are exerting their influence against further advances and assert that there is enough iron in sight for everybody, backing up these statements by taking contracts for deliveries through the last half of the year of No. 2 X foundry on the basis of $16.50 for this territory. While orders have been placed abroad for iron, it is known that but little of this is for foundry purposes, and the amount to be received will practically effect no change in the situation. The further strengthening of the market abroad will have a tendency to check importations.

PIG IRON.—For current requirements every seller makes his own figures and is to all purposes a law unto himself. Customers whose trade is considered valuable naturally have advantages even in such a market as now exists. No fixed standard of prices is therefore possible so long as present conditions prevail. For deliveries within the next sixty or ninety days transactions are taking place within the following range of figures, covering Philadelphia and nearby points: No. 1 X foundry, $18 to $18.50; No. 2 X foundry, $17.50 to $18; No 2 plain, $16.75 to $17; standard gray forge, $17 to $17.50; ordinary gray forge, $16 to $16.75; basic (chilled), $17.50 to $18; Bessemer, $20 to $20.50.

FINISHED MATERIAL.—The supply of finished material is approaching normal conditions with the exception of structural material, where requirements can not be taken care of without annoying delay. There is also some scarcity of steel bars and prompt shipments are difficult to obtain. A heavy demand is noted for sheets and in the higher numbers orders are hard to place without paying a premium. In other lines easier conditions prevail although there is plenty of work on hand to keep everybody going. Prices are about as follows for city and seaboard deliveries: Plates, ¼-inch and thicker, 1.75c to 1.80c; bars, iron or steel, 1.62½c to 1.70c; angles, 1.75c to 1.85c; beams and channels, 1.75c to 1.85c.

OLD MATERIAL.—Supplies of scrap appear to be generally light and there is consequently continued firmness in prices. The range of bids and offers is about as follows for deliveries in buyers' yards: Choice railroad scrap $21 to $21.50, ordinary light scrap $13 to $13.25, machinery cast $14.50 to $15, heavy steel scrap $18.75 to $19.50, old iron rails $21.50 to $22.50, wrought turnings $13.50 to $14.25, cast borings $8 to $8.50, old iron axles $25.50 to $26, old steel axles $22.50 to $23, old car wheels $17 to $17.25.

The Youngstown Iron Sheet & Tube Co., Youngstown, O., advises us that there is no truth in the report that it intends to add structural steel to the list of its products. A newspaper dispatch of this week had stated that the company would probably again increase its capital by $1,000,000 or $1,500,000 for the purpose of erecting a structural mill.

Warwick Iron & Steel Co. Report.

The report of the Warwick Iron & Steel Co., Pottstown, Pa., for the fiscal year ended Dec. 31, 1901, presented at the annual meeting last week, showed net profits of $18,030. Two dividends were paid during the year—3 per cent cash on May 10, and 3 per cent stock scrip on Nov. 10. The statement shows:

Assets.—Real estate account, $753,238; construction account of new furnace, $767,098; Yarnall Farm, $10,013; reserve account for repairing No. 1 furnace, $14,143; pig iron on hand, 367½ tons—$5,167; general stock at furnace (new machinery, etc.), $17,781; bills receivable (notes for pig iron not discounted), $23,206; cash in bank, $26,162; iron-making material on hand, ores, coal, etc., $232,784; Pottstown Iron Co.'s stock, $4,449; Glasgow Iron Co.'s stock, $1,938; accounts collectable, shipments of iron, November and December, $149,406; total, $2,500,391.

Liabilities.—Capital stock, $1,444,740; bonds account, $300,000; profit and loss (balance after deducting dividend), $58,074; pig iron account, $18,030; re-lining account (reserved from cost of manufacture), $7,933; all other accounts, $176,613; total, $2,500,391. The directors were re-elected, as also were the officers. Two-thirds of the stock was represented at the meeting.

Eight-Hour Turn for Blast Furnaces.

A meeting of the vice-president and executive committee of the International Association of Blast Furnace Employes, which includes most of the blast furnace workers in the Mahoning and Shenango Valleys, was held at Youngstown, O., Feb. 24. It was decided to ask for the establishment of three 8-hour turns instead of two 12-hour turns, and notice to that effect will be given to furnace companies in the near future.

Alabama Steel & Wire Co.

The Alabama Steel & Wire Co., of Birmingham, Ala., has purchased about 4,000 acres of the best steam and coking coal in the Birmingham district and will open up the property at once. This move is part of the company's plans for independent supply of raw materials, of which more in detail can be said later.

Independent Sheet Mills to Buy Steel Abroad.

At the meeting of independent sheet steel manufacturers representing interests in Wisconsin, Ohio, West Virginia, Pennsylvania and Maryland, held at Pittsburg Feb. 18 and 19, it was decided to send a commissioner abroad to purchase approximately 40,000 tons of billets and sheet bars. This material will be purchased either in England or Germany. The commissioner sails from New York this week. It is understood that W. F. Bonnell, of Otis, Bonnell & Co., Cleveland, has been selected for this mission. This steel is to be delivered at the various mills of the sheet interests represented at this meeting within the next six months. The labor situation was also considered and it was decided that the independent manufacturers should have a voice in determining and settling annual sheet workers' scales with the Amalgamated Association in the future. In addition the independent interests will work in harmony so far as the distribution of business is concerned. That is, if one concern gets inquiries or orders for sheets that it does not roll, the orders or inquiry will be referred to another mill in the association. A permanent organization was effected by the election of W. L. Glessner, president of the Laughlin Nail Co., Martin's Ferry, O., as president, and A. F. Baumgarten, vice-president of the Maryland Steel & Sheet Co., as secretary. At the next meeting the report of the special commissioner will be heard and a constitution and by-laws will be adopted.

The Wheatland rolling mill of the Continental Iron Co., at Sharon, Pa., which has been idle for some time while repairs were being made, resumed operations last week in all departments.

THE IRON TRADE REVIEW

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RAILROADS AS REGULATORS OF THE IRON TRADE.

In a recent issue a London contemporary calls British railroads to task for their unwillingness to spend money on new equipment, and draws a striking comparison between the readiness with which American railroad managers spend money and the slowness of managers of British railroads to invest a part of their earnings in improvements which would later on increase their earnings. It is pointed out that in the United States the railroads constitute the most important class of customers the iron and steel works have, their purchases being in large part responsible for the present activity.

This is all very true, and there is no question that if the British railroads made the improvements that are called for the British iron trade would not now be in the condition it is in; but at the same time the American railroads would set a much better example of they spent their money more regularly. Men as far-sighted as American railroad managers are must certainly have known that the present active conditions were coming, and it would have been better for the stockholders of the roads, and incidentally better for the iron trade, if the improvements now under way had been started during the lean years when materials and labor were cheap. This is when preparation might have been made for present conditions. The improvements would have cost the railroads less and they would now be earning more money because they would be able to carry the freight they are handling with much greater economy, and also be able to carry the additional freight which is offered, but which they cannot take.

We naturally look to the large interests to set an example of doing things at the right time and to exercise a regulating and steadying effect on trade, but we look in vain. The greatest powers in American commerce are the banking interests and the railroad interests, yet when times of depression come it is these interests which are foremost in curtailing their operations, and again when prosperity returns they are foremost to indulge in or encourage reckless expenditure. It is the individual capitalist or the corporation with a small number of stockholders that follows the proper course of carefully investing when everything is cheap and holding off when prices are high. If banking and railroad interests in the United States showed the same conservative wisdom there would be less depression and less boom in American trade.

The difficulty we have pointed out may be traced, however, largely to the same cause as the inaction of British railroad managers. Railroads and banks here as there are owned largely by stockholders who have comparatively little connection with the management, which is vested in officials whose stock holdings are relatively small. Railroad managers are afraid to spend money when stockholders are fearful lest they may not get their dividends, and must perforce wait until earnings are so large that there is no danger of dividends being interfered with. Banks are afraid to lend money in times of dullness because the immediate future may not show satisfactory earnings in the business established or extended, while in periods of prosperity they are comparatively reckless, feeling that before the storm comes they can make themselves safe, no matter at what cost to the general interests of trade.

From what is known of the United States Steel Corporation, its policy so far, and the personnel of those engaged in its management, it is at least safe to say that there is a distinct possibility that the influence of this large aggregation of capital will not be the same as the influence which banking and railroad interests have always exerted in accentuating either the downward or the upward course of trade. The corporation has been spending little, in these times of comparatively high prices for material and labor, in extension of plant. It is accumulating a surplus which may be spent in times when extensions can be most cheaply made and when such expenditures will have a direct effect in keeping money in circulation and also a sentimental effect in encouraging others in spending money.

The possibly of the erection of a steel plant at Canal Dover, O., is indicated in a dispatch from that place published in the past week. Nothing definite has been done or planned. The Penn Iron & Coal Co., however, recently went before the city council of Canal Dover to secure the vacation of portions of streets adjoining its blast furnace, so that contemplated improvements might be undertaken. These will involve the rebuilding of the stack, the erection of a hoist and top filling apparatus and a bin system for raw materials. The capacity of the furnace will be increased in this way from 275 to 400 tons. The work will begin, it is expected, within a month. In connection with the action of the city council on the matter referred to, it was stated by J. C. Reeves, of the old firm of Reeves Bros., whose sheet mill was sold to the American Sheet Steel Co., that the grants proposed would be indispensable to the carrying out of the steel plant project for Canal Dover, of which much has been said in the past few years.

It is expected that the erection of a second foundry iron furnace will be erected by Pickands, Mather & Co. on its recently purchased Toledo property, on the completion of the first furnace in the spring of 1903.

The Cincinnati Planer Co., of Cincinnati, again finds it necessary to increase its facilities and is now letting the contracts for an additional one-story brick structure with basement, to be used exclusively for erecting purposes.

SHEET MILL EXTENSIONS—NEW TIN PLATE PLANT.

(Special Telegram.)

PITTSBURG, Feb. 26.—Plans have been prepared by the American Sheet Steel Co. for the enlargement of both the Wellsville, O., and the McKeesport, Pa., plants. Four mills will be added to the Wellsville plant, increasing it from a six-mill plant to a ten-mill plant. The main building is also to be extended about 100 feet and the entire structure will be rebuilt of steel, but this will not interfere with the operation of the plant. Two of the present mills in the plant are to be thoroughly modernized. At McKeesport three mills are to be added, increasing the size of the plant from 13 to 16 mills. When these additions are completed Persifor F. Smith, manager of these plants, will have 26 mills under his jurisdiction instead of 19.

Contracts have been awarded for machinery and buildings of the new tin plate plant of the McKeesport Mfg. Co., McKeesport, Pa. The site is at Port-Vue, across the river from McKeesport. The contract for the erection of buildings has been awarded to the Fort Pitt Bridge Works, of this city. They will be of steel and nearly 1,000 tons of material will be required. The hot mill building will be 60 by 350 feet; the cold mill building, 75 by 350 feet; tin house, 45 by 220 feet; boiler house, 45 by 125 feet; packing house, 50 by 50 feet; electric plant, 40 by 40 feet. There will be 10 hot mills and 10 cold mills, the contract for which was taken by the Wheeling Mold & Foundry Co., of Wheeling, W. Va. The tin house will contain 19 pots but the contract for the machinery and equipment has not yet been awarded. The Brass Foundry & Machine Co., of Fort Wayne, Ind., has the contract for three Corliss engines capable of developing about 2,000-h. p. The boilers will be of the Stirling type with 2,100-h. p. capacity. The Keystone Electric Co., of this city, was awarded the contract for the electric equipment, and the Whiting Foundry Equipment Co., of Harvey, Ill., the contract for cranes. The plant is to be in operation in October. The officers of the company say that they have a supply of steel assured so that they will not be compelled to go into the open market for their material.

Consolidation of Railway Spring Works.

(Special Telegram.)

PITTSBURG, Feb. 26.—The organization of the Railway Steel Spring Co., with a capital of $20,000,000 is being perfected in New York this week. The new company taking over the constituent plants on March 1. Included in the combination are the A. French Spring Co., of this city, and the spring business of the Anderson-Du Puy plant of the Crucible Steel Co. of America, at McKees Rocks; Detroit Steel & Spring Co., Detroit, Mich.; National Spring Co., Oswego, N. Y.; Pickering Spring Co., Ltd., and the Charles Scott Co., of Philadelphia. The Crucible Steel Co., of America, according to outlined plans, will take over the crucible steel plant of the A. French Spring Co., at Canton, O., and the steel plant of the Detroit Steel & Spring Co., at Detroit, Mich. The new combination will not be a producer of raw material but will secure its entire supply from the Crucible Steel Co. of America. Half of the stock is common and the remainder preferred 7 per cent cumulative. For each $100 subscribed one share of preferred and one share of common was given. The headquarters of the combination will be in New York.

It is said that the stockholders of the E. W. Bliss Co., Brooklyn, N. Y., will hold a meeting for the purpose of taking action upon a proposition to take over the U. S. Projectile Co. The interests and business of the two corporations are in the main similar, and it is claimed that a consolidation will result in a considerable saving in expenses. In any event, it is worthy of note that practically the same interests are prominent in both companies. E. W. Bliss is the president of the Bliss Co., with James W. Lane vice-president, and William A. Porter secretary and treasurer. Mr. Bliss is also president of the United States Projectile Co., A. T. Porter, vice-president; C. E. Porter, secretary, and Mr. Lane treasurer. The former corporation, which has a capital of $2,000,000, was incorporated in West Virginia in 1892, succeeding an English corporation, the E. W. Bliss Co., Ltd., which had itself succeeded the E. W. Bliss Co., a New York corporation. The business of the company is the manufacture of dies, presses and special machinery for sheet metal goods and manufacturing the Whitehead torpedo exclusively for the United States government. The United States Projectile Co. was incorporated under the laws of New York in 1890, with a capital of $500,000, to engage in the manufacture of projectiles of all kinds, as well as forgings of various kinds and metal-working machinery.

Blast Furnace and Steel Works for Sheet Mills.

For some time plans have been under way for the establishment of an open-hearth steel plant at Canton, O., to supply steel to the allied Berger and Carnahan mills, the former producing sheets and the latter tin plates. In connection with the efforts of the independent sheet mills to provide a steel supply of their own, as discussed at their Pittsburg meeting last week, it is stated that a proposal for increasing the capacity of the projected Canton steel plant is under consideration. It has been intimated also that a blast furnace might also be built, and arrangements for ore supply made, so that there might be complete independence from the ground up. The Carnahan Tin Plate & Sheet Co., of Canton, informs us that it has had a blast furnace and steel plant project under consideration; that no definite decision has been reached, but that it is very probable the two plants will be erected.

H. W. Caldwell & Son Co., Chicago, manufacturers of elevating, conveying and power transmitting machinery, has recently opened an office in New York City, at 410, 95 Liberty St., which will be in charge of R. T. Pearce, mechanical engineer.

The Curtis & Co. Mfg. Co., St. Louis, Mo., reports that its sales for the two weeks ending Feb. 8 consisted of 11 compressors and 106 hoists, as well as a number of hand cranes and seven ice cranes.

At a meeting of the stockholders of the Dillon-Griswold Wire Co., Sterling, Ill., held Feb. 13, the following officers were elected: W. M. Dillon, president, general manager and treasurer; Judge S. G. Tenney, of Williamsburg, Mass., vice-president, and W. H. Shields, of Troy, N. Y., secretary. With the exception of Judge Tenney, who was elected to fill the vacancy caused by the death of the late J. Wool Griswold, the officers remain the same as that of former years. The company contemplate remodeling and enlarging the plant, giving it a greater capacity than it now has.

The Birmingham Brass Co., Shelton, Conn., is reported as a recent addition to the constituent companies of the American Brass Co.

At the plant of the Leighton & Howard Steel Co., East St. Louis, Ill., successor to the Shickle, Harrison & Howard Iron Co., an additional 20-ton furnace is being built, bringing the number up to five.

F. R. Phillips & Sons Co., of Philadelphia, have recently opened an office at 339 Fifth Ave., Pittsburg, where F. Rees Phillips will be permanently located. The company finds this necessary to take care of its largely increased business in that district. It has of late taken several contracts for sheet and tin mills, machinery, chilled rolls, etc. In connection with its foreign business the company has imported considerable steel of late and placed orders for a very large tonnage, principally for Eastern mills, and with its Pittsburg office established will be in a position to deal directly with Western mills.

The Commonwealth Steel Co., of St. Louis, recently incorporated, has plans which will be carried out at once for six 20-ton basic open-hearth furnaces, for its steel casting plant, which will be the largest in the country.

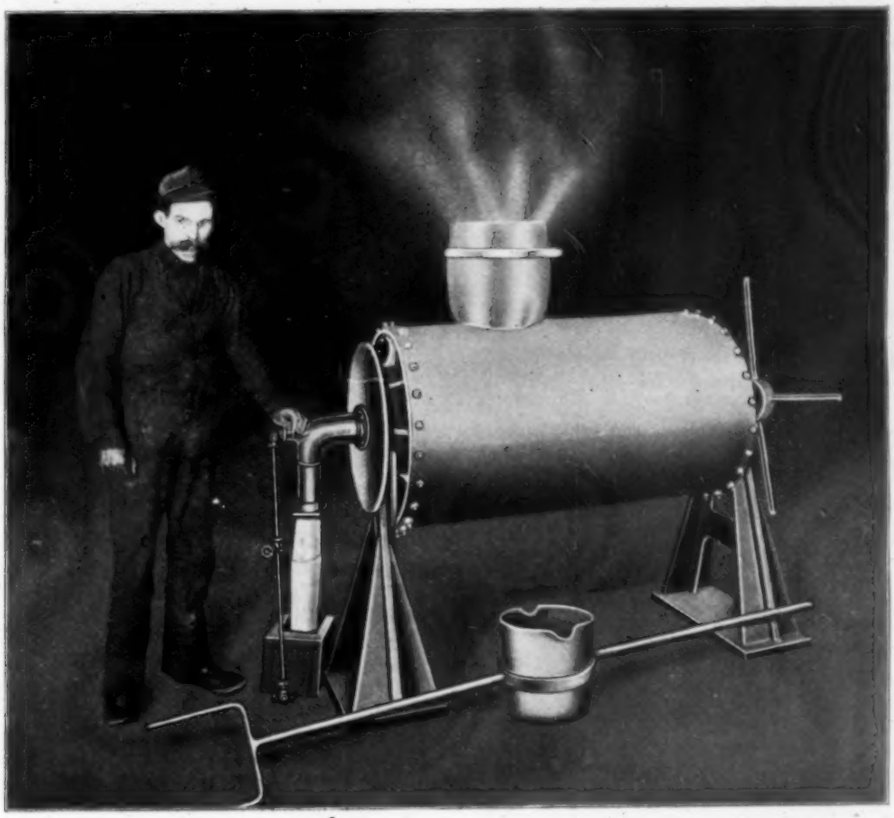
M. H. Treadwell & Co., 95 Liberty St., New York, have closed a contract with the Sharon Steel Co., Sharon, Pa., for supplying portions of the equipment and materials for four 50-ton basic open-hearth furnaces.

THE CHARLIER ROLLING OIL-BURNING FURNACE.

Various furnaces have been designed with the object of reducing the cost of melting such metals as are generally melted in crucibles. The expense attached to the use of the latter has offered a field for inventive genius, and on the continent of Europe, and in a few instances in this country, furnaces are in use which differ radically from the ordinary brass furnace.

Our illustration shows one of the latest furnaces of this class, designed by H. J. J. Charlier, formerly connected with M. M. Piat & Fils, of Paris, France, who are also builders of special melting furnaces, and later with the Ajax Metal Co., of Philadelphia. The Charlier furnace is now being manufactured and introduced to the trade by the J. W. Paxson Co., of Philadelphia. It consists of a casing, lined with fire brick, and provided with an opening at one end through which the fuel oil is sprayed into the furnace with the aid of a small fan blower, a supply of compressed air not being necessary, as is the case with some styles of oil burning furnaces.

The oil may be pumped up by a hand pump, from a tank located below the floor level, preferably outside of the foundry, into a smaller tank placed at an elevation above the furnace. From this it is conducted to the burner by gravitation, and there met by a jet of air under a pressure of about five ounces. The supply of both oil and air can be regulated through suitable valves.



THE CHARLIER ROLLING OIL-BURNING FURNACE.

After the furnace has been partially heated about half of the charge to be melted is thrown in and the balance fed through the hopper, for which it is customary to utilize a burnt out crucible having a four-inch hole in its bottom. The heat escaping from the furnace is utilized to melt the metal placed in the hopper from which it drops into the furnace and is there brought to greater fluidity. When the melting is completed the hopper is removed and the metal is emptied through the aperture filled by the hopper.

To put in a new lining the furnace is removed from the supports on which it is mounted and placed in an upright position, the bolts at one end are unfastened and the casing at that point taken off, when the furnace may be lined as any ordinary cupola or brass furnace. It is calculated that a lining will last about four months, and that with the best of fire brick this will cost between $12 and $15. The shell of the furnace is 30 inches in diameter and 60 inches in length; when lined these dimensions are reduced to 22 by 52 inches.

Besides the economy resulting from the discarding of crucibles the makers claim additional advantages in having no fuel or ashes to handle and that no metal can be lost as in ordinary furnaces; consequently there is no need for machinery, usually employed to recover this, such as cinder mills and separators. No stack is required, nor any of the tools used in the handling of crucibles. The Charlier furnace in operation gives but little smoke or smell. The insurance laws allow fuel oil to be stored in tanks underground and pumped through pipes to the furnace. Fuel oil is of low test and will not flash like kerosene. The cost of keeping the furnace in operation is estimated at 16 cents per hour with fuel oil at 4 cents per gallon and it is claimed that natural gas can be used to still better advantage.

The loss in melting through oxidation is said to be no greater than that which takes place when melting with crucibles. All kinds of metals may be melted in the Charlier furnace, the accompanying illustration being from a photograph taken when iron was being melted, after which a heat of brass was taken off, without permitting the furnace to cool down. Should slag be found in the furnace at the end of a heat it is simply turned over with the opening downward and the heat continued until this is all melted out, when any other metal may be charged without fear of contamination from injurious particles left over from previous melting. For melting ferro-manganese or ferro-silicon for use in steel casting this furnace is claimed to be especially adapted. The metal may be kept in a fluid condition as long as desired and should more be withdrawn than is needed for a mold the balance may be returned to the furnace, where it is reheated in a very short time. Special advantage is claimed for this furnace in the melting of phosphor-bronze. The temperature in the furnace is entirely in control of the operator.

The melting capacity of the Charlier furnace under ordinary conditions is 600 pounds of brass per hour, nine heats having been procured in a day from one furnace. Five hundred pounds of iron have been melted in 1½ hours and the same amount of steel scrap in 2½ hours. Among other places these furnaces have been installed in the brass foundry department of the Wm. Cramp & Sons Ship & Engine Building Co., and

the Hooks Smelting Co., both of Philadelphia. Furnaces will be built of a capacity up to 4,000 pounds and the J. W. Paxson Co. have an experimental plant in operation which is open for inspection and where the furnace may be seen at work.

SUGGESTED AT THE SHOP.

BY F. O. REMAN.

There are a good many things to worry over in the shop and a lot of them are out of sight so far as the average individual goes. For this reason, and possibly a few others, the man in charge does not always get the credit that should come his way. The credit is more likely to go to the fellow who advertises his difficulties than to him who avoids them. Just the same, I have a great regard for the man who gets around trouble easily and keeps up a steady grind without any annoying hot-box in the shop machinery or the men. His coolness gives confidence to all hands and he gets advertised as a safe man to have around.

* * * * *

Advertising is the business of the office, as a general thing, but the rest of the force has something to do with the repute of the plant, and this is the main thing in advertising, anyway. The foreman of a machine shop can do considerable of this kind of advertising because the work he has in charge is the mainstay of the firm's reputation, and a good name may outlast the rest of the plant. I went into a machine shop some time ago and heard a little tale in regard to the benefit of advertising. Perhaps "publicity" would be a better term to use where advertising is not meant as so many inches of eloquent space shown to so many thousand readers. But the effect was the same and there is little room for mistake.

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The foreman said they had taken a contract for a number of machines, each of these having a traverse or lead screw as a part of the device. These screws were not required to have any very refined degree of accuracy, and when the representative of the Slick screw machine came along and was told the limit of the job he was ready to guarantee as good work as the specifications demanded. He could knock the average lathe kite-high on the rate of production, and boost the pile of profit. This was velvet. It charmed the firm and the foreman, but, incidentally, there was the grinding of an axe.

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The foreman says that it seemed no time at all before everybody in that line knew about the making of these screws upon that Slick screw machine and he heard comments upon it in various places. Screws of all kinds are in the nature of things appropriately made on screw machines, but there seems an unwritten law that a screw fit for a machine tool feed should not be cut that way. It is a repetition of the condition which says a certain thread may be cut with a die, while another must be finished in the lathe, and a combination method is not the easiest thing in the world to limit properly. It is a good thing for a salesman to circulate the story of possibilities with his machine, even if it does go hard with current practice; but I know of one place where a slightly critical reception awaits a representative whose efforts toward the advertising of screw-cutting methods have been well meant and are all right when properly understood.

* * * * *

"It was a lesson for me," said my friend, the foreman. "I had made up my mind to be less easy in these matters when along came an opportunity to put my new resolution into practice. A bright fellow brought a specimen of tool steel that was warranted to stand up and cut when other steels would simply wilt and fall out of the game. It would not only cut, but keep busy and the cutting would be continued in our next, and so on. Nothing would give him more pleasure than to try it then and there. Just give him some job that was wearing the patience of the tool-dresser and the machinist as fast as the edge of the tools and he would show a wrinkle or two while the rest of us could let a reef out of our experience. I got away long enough to have two or three spindles, that had been put aside for annealing, thrown on top of the pile where one of our men was at work. These spindles had been left harder than the rest in some way and were suited to the testing business. I picked one of them off the pile when we got out in the shop, put a dog on it and the steel chap started in to show a few things. His stunt did not last long and he commented on the hard stuff. Another piece was no better, and he failed to find any good reason why his tool steel would not do so well as the work I claimed was done daily. He was phased, but he won't lose anything as I told him to leave us a sample bar and I'll give him an order to soothe my conscience, but he is of the class who will not trot around telling how his tool steel sliced up the stock we use. If he says anything about it he will wonder why in time we use harder steel for spindles than the rest of the people, and that sort of advertising is not going to harm us a lot. I tell you there's a heap more in this business than the building of machinery."

* * * * *

And to most of this I cheerfully subscribed and feel disposed to add that another foreman of wide experience tells me something which goes to prove that peculiarities of this sort are not confined to the people who buy and sell machines—the men who make them are in the same class. He does some neat work in welding and is quite an authority on the union of metals by heat. Among the useful articles which are frequently used in the shop is a powdered substance which I will call the Boston welding mixture, but which goes by another name among the men at work there. I learn that the workmen have great confidence in the value of the stuff and they certainly get excellent results. The foreman says that it is a good thing they are all agreed about its merits. "Human nature must have a scapegoat of some sort when things go wrong and the fewer chances for an excuse the quicker one can place the blame on the right shoulders. The men know that the welding compound is bought from the one place and is strictly uniform. No one would be willing to blame the mixture when something or other is off color. Not much. He would look for the trouble in another direction, and so long as he has faith that none of the people near him have had anything to do with making it, matters move smoothly. It's wonderful how much confidence a man can develop in men and methods he has never seen.

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"There's something more to the subject, of course, and that refers to the manufacture of the mixture. The men don't know what is in it and a little mystery about something that works well soon builds up a reputation and holds it there. I don't mind telling you that borax, filings and silica is about all it contains. I would sooner say silica than sand and I am sorry I don't know the Latin for borax and filings, or the receipt would be more scientific. Now that you know how it is made it will do no great harm to add that the mixture is made right here by myself."

* * * * *

The gentle art of humbugging the other fellow is at the bottom of many other secret operations. The scheme has good points, but there are limitations, and some of the manufacturers who seem disposed to tell all they know have built up a big business along with this publicity. Some of their stunts the other fellows couldn't or wouldn't undertake, but the account was at their service, anyway. The story of any man's success with a manufacturing business is not fully told by a description of the development of the product or of the men who struggled in the early days. Every plant has some characteristics that may be put down under the general heading of "climate." The conditions affecting life, health, and comfort have an immense influence in the work sent out from any shop. Unfortunately they are not always reckoned as highly important factors in machine construction and design.

The London *Ironmonger* makes this answer to an inquiry whether the gauge of galvanized sheets refers to the sheets before or after the spelter has been applied: "The gauges represent the sheets before galvanizing, in accordance with the general custom of the trade. It is not, however, a universal practice to sell galvanized iron in this way, some firms, especially those doing an export trade, reckoning the gauge after galvanizing. If, therefore, a buyer wants to be sure of receiving a certain gauge he should specify what thickness of black sheet he requires."

PERSONAL.

John M. Hartman, president of the Hartman Co., Philadelphia, was elected a member of the common council at the municipal election in that city Feb. 18.

E. H. Martin, formerly connected with the Diamond State Steel Co., has been appointed metallurgical engineer of the Carnegie Steel Co., Pittsburg, vice Ambrose Monell, engineer of tests. Mr. Monell has been appointed assistant to President Corey of the Carnegie Steel Co.

Andrew Carnegie has given $30,000 to the citizens of North Bessemer, Pa., with which to build and equip a library. Mr. Carnegie proves to be also the donor of $100,000 to the University of Wooster, Wooster, O. The conditions he imposed were met on Feb. 21, and the college now has $350,000 for rebuilding.

J. G. Butler, Jr., of Youngstown, O., has been mentioned as a possible candidate for Congress from the Youngstown, O., district. Mr. Butler says that he will not be a candidate for the office.

F. Wiard, secretary and superintendent of the Dobbie Foundry & Machine Co., of Niagara Falls, N. Y., has resigned.

C. M. Ladd, superintendent of the Joliet Bridge & Iron Works, Joliet, Ill., has resigned.

J. H. Ross has been appointed superintendent of the Springfield, Ill., plant of the Republic Iron & Steel Co., which will be placed in operation shortly, after an extended idleness.

President C. M. Schwab, of the United States Steel Corporation, was in Pittsburg a portion of last week.

George T. Oliver, president of the Oliver & Snyder Steel Co., of Pittsburg, accompanied by his family, left for an extended tour of the west last week.

Thomas L. Sedgwick has resigned as superintendent of the Finished Steel Works, of Youngstown, O.

Victor M. Delameter, secretary of the Sharon Steel Co., of Sharon, Pa., has tendered his resignation.

G. Oya, of Tokio, Japan, representing the Imperial Government Railways, of that country, was in Pittsburg last week. He is making a study of American industrial plants and railroads.

Homer J. Lindsay, assistant to the president of the United States Steel Corporation, left Pittsburg last week for a stay in California.

C. H. Hollingsworth, supervising engineer of the Colorado Fuel & Iron Co., has resigned. He has gone to Birmingham, Ala.

A. J. Moxham has resigned as general manager of the Dominion Iron & Steel Co., Sydney, Cape Breton. He will continue as a director of the company and as vice-president. Herrick Duggan is spoken of as his successor as manager. The controlling interest acquired some time ago by James Ross, the Canadian banker, resulted in the retirement of H. M. Whitney from the presidency, Mr. Ross succeeding him.

John J. Cone, of the New York office of the Robert W. Hunt & Co., Chicago, will take with him to Europe to inspect the rails ordered in England and Belgium for the Mexican National Railway and the Louisville & Nashville Railway, the following staff of inspectors from the Chicago office: Morgan L. Jones, Geo. R. Smith and August Schwar.

Julian L. Yale, president of the Julian L. Yale & Co., The Rookery, Chicago, has been made vice-president of the American McKenna Steel Works Process Co., Joliet, Ill.

First Ingot Cast at Sault Ste. Marie, Ont.

The Algoma Steel Co., which is the name under which the Clergue syndicate operates the new steel plant at Sault Ste Marie, cast the first ingot at its Bessemer plant on Tuesday, Feb. 18. This date was the anniversary of the first foundation work. There were present in addition to the engineers, including C. H. Wellman and W. N. Sawyer, of the Wellman-Seaver Engineering Co., about 1,000 persons representing the business and industrial interests of the two Sault cities. The pig iron from which the first steel was made came from the Midland, Ont., furnaces, and was made in turn from ore from the Helen mine. Two blast furnaces are under construction. The first is about completed and the foundation for the second will soon be laid. D. D. Lewis is general superintendent and F. W. Waterman, of the Wellman-Seaver Engineering Co., formerly with the Dominion Iron & Steel Co., and the Lorain Steel Co., had charge of construction. Portions of the Bessemer plant, including two 5-ton converters, engines, etc., were taken from the Danville Bessemer Co.'s works, formerly the North Branch Steel Co. plant, at Danville, Pa.

La Belle Iron Works.

The LaBelle Iron Works, Steubenville, O., are erecting immense additions. In fact almost the entire Steubenville plant is being rebuilt and enlarged. Several weeks ago a portion of the new tube mill, containing three mills for making butt and lap weld tubing up to 12 inches in diameter was placed in operation. The remainder of the mill will be started shortly. The skelp capacity of the plant has also been increased by the addition of three mills, until today this is the largest single skelp plant in the country, having an output of 1,500 tons of steel skelp daily. The erection of a new open-hearth plant has already been commenced and when completed will have a capacity of 600 tons of steel daily. Present plans call for a six-furnace plant, but the open-hearth building has been so constructed that this can be increased to 10 furnaces at any time. This, no doubt, will be done shortly after the six furnaces under erection are completed. From present indications the first steel will be made about May 1.

The blast furnace operated in connection with this plant was torn down last fall and is now being entirely rebuilt. The stack will be 90 feet high and will have a capacity of 400 tons daily. The furnace will operate on basic iron entirely. It will be completed about August. A blooming and bar mill will be erected alongside of the open-hearth building. Adjoining the LaBelle plant the Pope Tin Plate Co. is erecting a ten-mill tin plate plant. Work on it has been considerably delayed, however, for the reason that it has been almost impossible to secure structural material, the building being only half completed. The LaBelle plant will furnish tin bars for this plant. When the open-hearth plant of the LaBelle Iron Works is completed it will only supply a portion of the raw material required by the plant and while no plans have yet been drawn up it is altogether probable that this company will make itself entirely independent, so far as raw material is concerned, at no very distant date.

Colorado Fuel and Iron Co. Wire Plant.

In the last issue of *Camp and Plant*, of Pueblo, Col., the weekly publication devoted to the Colorado Fuel & Iron Co.'s social and industrial betterment work, some details are given of the wire mill now building as part of the Minnequa works at Pueblo. It is spoken of as "the largest wire mill in America." The product will be all sizes and shapes of wire and wire products, including telegraph and telephone wire, field fence wire, barbed wire, woven wire, all sizes and kinds of electric wire, including naked and insulated copper wire, and all sizes of wire nails. The annual capacity of the mill will be between 200,000 and 300,000 tons of wire. Six thousand kegs, or 300 tons of wire nails will be made in the nail department every 24 hours, 150 tons of barbed wire, and 150 tons of field fence wire will be produced daily in the fence wire department. The balance of the daily product will be made up of electrical wire and miscellaneous wire products. There will be 400,000 square feet of floor space when the plant is finished. It is expected that the first wire will be drawn June 15. In the rod mill and wire mill 3,000 men will be employed by September.

The annual banquet of the Engineers' Society of Western Pennsylvania was held at the Hotel Schenley on Friday evening, Feb. 21. Victor Beuntner acted as toastmaster and toasts were responded to by E. B. Taylor, fourth vice-president of the Pennsylvania Railroad; Dr. W. J. Holland, Capt. D. P. Jones, U. S. N., and C. F. Scott, president of the society. The regular monthly meeting was held on Tuesday evening, Feb. 15, when a paper was read by Dr. W. B. Phillips on "The Iron Resources of Texas." The following were admitted to membership: E. S. Ekman, W. P. Engleman, F. R. Hertzog, E. L. Hoofring, D. M. Howe, B. M. Kershner, J. L. Klindworth, Morris Knowles, W. P. Miller, H. E. Myers and B. I. Weller.

LARGE ADDITIONS TO OPEN-HEARTH CAPACITY.

PITTSBURG, Feb. 24.—Open-hearth steel plants projected and under construction by various independent steel interests throughout the country will increase the open-hearth steel production of the United States not less than 5,000 tons per day. This is equivalent to a production of over 1,500,000 tons per year and is an indication of the vast increase in the use of open-hearth steel in this country. Further, the fact that this increase in capacity is being provided for by interests outside of the United States Steel Corporation shows that the independent producers are already alive to the fact that to insure the constant operation of their plants they must provide a means of securing their raw material. Never in the history of the American iron and steel trade has there been under construction or planned at one time steel plants of so great a capacity. Nor has the planning of open-hearth plants ceased, as a number of independent steel interests, notably the newly organized independent sheet manufacturers' association is contemplating the erection of a plant to provide sufficient raw material for all the plants in the association.

Inasmuch as the open-hearth plants can be operated on varying quantities of ore, pig iron and scrap material, there is little possibility of cutting off the supply of raw material from these plants. While old material has slightly advanced in price of late, due to the general advancing iron and steel market, there is little doubt that the market will continue strong on account of the increasing demand for this material for open-hearth purposes. In addition the ore interests not controlled by other producers of steel will be amply able to supply the furnace capacity required for these open-hearth plants.

Among the largest works projected is that of the Union Steel Co., which will be located at Donora, Pa. The plant is to contain 12 50-ton furnaces with a daily capacity of 1,200 tons of steel. In connection with this plant two blast furnaces will be erected and will supply the pig iron required in the operation of the steel plant.

The Crucible Steel Co. of America is erecting a ten-furnace plant at Clairton, Pa., which will have a daily output of 1,000 tons. The work of erection has already progressed to a considerable extent and several of the furnaces will be blown in shortly. In connection with this plant three blast furnaces are being erected.

The Youngstown Iron Sheet & Tube Co. of Youngstown, O., has plans prepared for a 12-furnace plant with a daily capacity of 1,200 tons. For the present, however, only six furnaces will be erected, with a daily capacity of 600 tons. This company has also provided itself with a blast furnace.

The LaBelle Iron Works of Steubenville, O., has under construction six furnaces of a 10-furnace open-hearth plant. The furnaces now under erection will be completed about May 1 and will have a daily capacity of 600 tons. There is little doubt that the additional four furnaces will be erected at an early date owing to the large capacity of the finishing department. This plant also will be operated in connection with a blast furnace having a daily capacity of 400 tons. The furnace will not be blown until next August.

The Grand Crossing Tack Co., of Grand Crossing, Ill., is planning to install an open-hearth plant which will have a capacity of 100 tons daily when completed. This plant will depend upon the open market for its pig metal.

It has been understood that the Lackawanna Steel Co.'s plans for its extensive South Buffalo works included considerable open-hearth plant, but no definite steps in this direction have been taken as yet. It may be taken for granted, however, that open-hearth steel will form a considerable percentage of the 1,250,000 tons of output the plant is expected ultimately to attain.

The Sharon Steel Hoop Co., as noted elsewhere in this issue, has let a contract for open-hearth furnaces, which will mark its entrance upon steel making.

The Sharon Steel Co., of Sharon, Pa., has under course of erection four 50-ton open-hearth furnaces, increasing the steel output from 800 to 1,200 tons daily. In addition two blast furnaces are being erected that will increase the iron output from 500 to 1,200 tons daily. The blast furnaces will be amply able to supply the open-hearth plant.

Wickwire Bros., of Cortland, N. Y., are having plans prepared for an open-hearth plant of three furnaces with a total daily capacity of 200 tons. Pig metal will be purchased in the open market.

The Alan Wood Co., of Conshohocken, Pa., is erecting an open-hearth plant with a daily capacity of 300 tons. This concern will also depend upon the open market for its pig metal.

Jones & Laughlins, Ltd., will have their new Talbot open-hearth furnace in operation within 60 days. The furnace is located at their South Side, Pittsburg, Pa., plant, and will have a daily capacity of 400 tons. It is probable that another furnace of the same size will be erected before the end of the year.

Should the concerns which have plans prepared for extensions to their open-hearth plants decide to carry them out at an early date, the open-hearth steel production of the country would be still further increased 1,400 tons per day, or nearly 500,000 tons per year. This would increase the total addition to open-hearth steel production from 1,500,000 tons per year to 2,000,000.

There is every indication that all the plants now projected will be completed within the next year or 15 months, and unless the finishing capacity should be greatly increased by that time, the steel situation will be much relieved. The new plants and additions referred to above will produce steel for rolling into its final form. The furnaces now building or projected for steel casting plants will increase the open-hearth tonnage still more.

Again the Cincinnati "Editorial" Factory.

It might be presumed that the publicity given in the trade press to the operations of the "United States Trade Reports," of Cincinnati, would put an end to the solicitations from that quarter. But circular letters can be cheaply produced and the postal service is indulgent, and the supply keeps up. One of the latest of the "editorials" from this mill was sent to Turner, Vaughn & Taylor Co., of Cuyahoga Falls, O. It was like the others in that the judgment was arrived at "after thoroughly looking into the subject and practically testing and examining the various makes." The only alteration from the one recently reprinted in these columns was that in the form blank after the words, "we are forced to concede the preference to," the Vaughn sewer pipe press was inserted. There was the usual offer to sell copies of the paper containing the notice at 15 cents apiece, with reductions for quantities until 8 cents became the basis where 1,000 copies were taken.

The Turner, Vaughn & Taylor Co. replied to the proposal in the terms it deserved and have forwarded us the correspondence with a view to informing our readers that the Cincinnati "fake" still has some vitality.

New Open-Hearth Steel Plant.

At a recent meeting of the Sharon Steel Hoop Co., of Sharon, Pa., it was decided to erect an open-hearth furnace plant with billet and bar rolling mills having a capacity of about 300 tons a day. The plant will be designed and erected under the supervision of E. L. McGary, consulting engineer of 223 Fifth Ave., Pittsburg. At present the Sharon Steel Hoop Co. secures its supply of billets from the Sharon Steel Co.

At the annual meeting on Jan. 23, 1902, of the Engineers' Club, Scranton, Pa., the following officers for the ensuing year were elected: President, H. H. Stoek; vice-president, B. F. LaRue, professor of civil engineering in the International Correspondence Schools; secretary, A. E. Lister; treasurer, F. J. Platt; corresponding secretary, A. B. Dunning, librarian, H. M. Lane, professor of mechanical engineering in the International Correspondence Schools; directors, W. M. Marple, C. C. Rose, and H. W. Rowley. President Stoek is the editor of *Mines and Minerals*.

William H. Salisbury, senior partner of W. H. Salisbury & Co., Chicago, dealers in engineers' supplies, died at his home in Chicago, Feb. 19.

The Philadelphia Pneumatic Tool Co., of Philadelphia, has appointed Berger, Carter & Co., 330 Market St., San Francisco, Cal., as its representatives on the Pacific Coast.

THE LEONARD FOUR-CYLINDER ENGINE.

This engine is designed to meet certain requirements where high speed and light powers are an advantage, such as detached machinery, pumps, dynamos, fans, farm and dairy machinery, etc. It also is particularly adapted to launch and small vessels and automobiles, owing to its compactness and strength in design of frame and the fact that no working parts are exposed to gather dust and dirt.

One of the most important features of this engine is its simplicity. Of the few parts, all are easy of access. There are only two places that require packing. Fig. 1 shows the complete engine as used for stationary purposes. The frame, cylinders and bearing are all cast in one piece. There are four cylinders, single acting, set at right angles to the crank shaft, which is one piece of steel. Four pistons with connecting rods attached to an ingenious center bearing on the crank shaft (which runs in oil inside the frame casing), perfectly balanced, and owing to the arrangement of cylinders the strain on the crank pin is constant, as one cylinder is under pressure while the one at right angles is exhausting.

The valve gear is of the rotary type. It is operated by a disc, as shown in Fig. 3. This valve is controlled by the lever in Fig. 1, having a ratchet stop, and by this arrangement the valve may be shifted, causing the pistons to take steam in the opposite direction and thus reverse the motion of the crank. The engine may also be slowed down or stopped by this lever, and by this same movement a variable cut off is obtained. The operation of the engine is as follows: Steam is admitted to the side of the valve frame, passing through ports in the valve to the tops of the cylinder and is exhausted back through the same valve to an exhaust chamber in the valve casing, Fig. 3, and thence to the exhaust pipe.

All wearing parts are bronze bushed and can easily be replaced. No attention is required to run the engine other than to keep the oil cups filled. There are no rods to key up, or knocking of moving parts inside the casing, as in most engines of this class, and an interesting feature is that it starts at once and at any point, either right or left at the will of the operator. It is compact, strong and light in weight when compared with many small engines built for similar purposes. Joseph E. Wise, Bourse Bldg., Philadelphia, Pa., is sole agent.

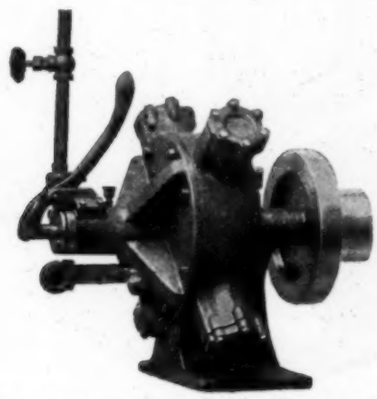


FIG 1.—COMPLETE ENGINE FOR STATIONARY PURPOSES.

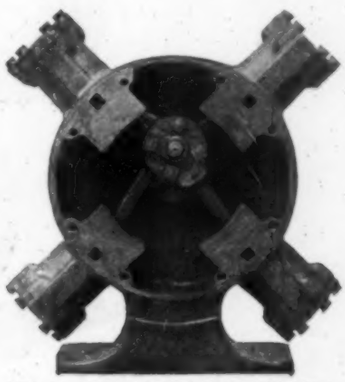


FIG 2.—VALVE DISC AND CRANK CASE COVER REMOVED.

FIG 3.—VALVE OF LEONARD ENGINE.

The plant of the Southern Foundry & Machine Works, at Fredericksburg, Va., has been sold by Charles Tyler, of Baltimore, to John T. Dale, of Chicago, for $70,000. A stock company is to be organized by the new purchaser and the business will be conducted on a much larger scale than heretofore. A large amount of new machinery is to be added and it is possible that the machine shop will be enlarged. John T. Dale will be president of the new corporation, and J. Melbourne, secretary and treasurer.

The Miller Gas Engine Co., Springfield, O., whose plant was recently destroyed by fire, has leased an abandoned steel plant at Springfield and will fit it up immediately for the construction of its gas engines. The company has a large number of unfilled orders on its books.

TRADE PUBLICATIONS.

The 1902 catalogue of the Brown & Sharpe Mfg. Co., Providence, R. I., is being sent out to the trade. It contains a number of machines and tools added since the publication of previous editions, instructions for finding the construction numbers of the different machines for convenience when ordering parts for repairs, etc. It is necessary that the new edition should supersede the older copies and the Brown & Sharpe Co. will send a copy to any address upon application. The 1902 catalogue contains the gearing and other formulas, etc., that have made this publication a handy reference work in the shop and office.

We have received the seventh edition of catalogue No. 24, treating of Riedler pumps, and the fifth edition of catalogue No. 46, devoted to the Riedler compressors and blowing engines, issued by the Allis-Chalmers Co., Chicago. These books are standard size, 6x9 inches, and in addition to the usual data found in a trade publication, are exceptionally well illustrated and the text contains some interesting facts in regard to this particular valve, the Riedler, and a number of useful tables.

The Cleveland representatives, Messrs. Britton & Britton, have favored us with the catalogue of the paper pulleys manufactured by the Rockwood Mfg. Co., Indianapolis. The pamphlet treats of paper pulleys, paper frictions, paper friction fillers, paper polishing wheels and apparatus for engaging and controlling the friction gearing.

"A Few New Ideas on Shop Costs" is the title of a booklet sent out by George K. Hooper, 31 Milk St., Boston. The work is intended to place before the manufacturer the possibilities of the system devised by the author for the practical solution of questions arising in manufacturing plants.

The catalogue of the David Maydole Hammer Co., Norwich, N. Y., is being sent out with a little pamphlet written by James Parton. This is reprinted from "Captains of Industry" and tells in an interesting way the story of the hammer maker, David Maydole. The catalogue of the David Maydole Hammer Co. is illustrated in colors and is a commendable piece of work.

The advantages of oil fuel in railroad shops and manufacturing plants are discussed in the pamphlet prepared by the Railway Materials Co., Old Colony Bldg., Chicago. The Furguson type of furnace is shown and described in a number of forms, including its application to the following uses: Flue welding; flue annealing; annealing boiler and flue sheets; case hardening; heating material for supplying bulldozers and forging machines; heating stock for bolt machines; heating rivets and small forgings; also for spring fitting, rolling furnaces, etc.

A descriptive catalogue treats of the products of the National Fire Proof Paint Co., Chicago. A number of color cards are submitted of the regular lines of paints, a description of the National fire proof transparent liquid, the National fire proof lubricating oil and a number of testimonials and other data in reference to the quality of these goods.

The Archer Iron Works, Chicago, manufacturers of steel wheelbarrows, lumber carts, trucks, steel ore and coal cars, wheels of all kinds, ornamental and structural iron work,

have a new catalogue of these products. The pamphlet contains complete dimensions, weights and prices of the majority of the goods listed and the line is well illustrated.

The recent catalogue of the Foster Engineering Co., Newark, N. J., is devoted to the Foster pressure regulator (reducing valve) and other high grade specialties for steam, water, gas or air. Some 96 pages are given to a thorough exposition of the construction and merits of this type of valve and the publication is embellished with many excellent half tones, wax engravings, etc.

Calendars have been received from the Lincoln Electric Co., Cleveland, the Fort Wayne Electric Works, Fort Wayne, Ind., and the Reese-Hammond Fire Brick Co., Boliver, Pa.

PRESIDENT W. L. BROWN ON THE STEEL SITUATION.

W. L. Brown, president of the American Shipbuilding Co., and of the South Chicago Furnace Co., and a member of the firm of Pickands, Brown & Co., is thus quoted on the situation at lake shipyards as affected by conditions at the steel mills, and on the outlook in the iron market:

"If the mines can produce it, and the facilities for transportation can carry it, the production of iron ore in the lake region the present year will exceed 25,000,000 tons. The weak point is in the transportation facilities from the docks to the furnaces. The railroads have not enough cars and locomotives. Never in my long experience in the iron trade have I seen such a condition of affairs as exists today. The demand for material is such that the trade is actually congested. Corporations which would seem to have the call for a supply of coke are running with half their furnaces idle, because the coke cannot be produced as rapidly as it is required by the furnaces of the country.

"In the iron part of our business we have calls for metal which we cannot fill. A day or two ago the shipyards had three contracts in view for steamers to come out late next fall. Before signing the contracts we decided for safety to find out what we could expect in the way of steel. We found that the steel for the boats could not be furnished in time for their construction this season. Of course, the contracts were not closed, for vesselmen do not care to contract for boats they will not get until the spring of 1903. Structural iron orders now cannot be delivered at the best before November next. In times past I have seen eras of boom, where men traded far beyond what they ought to have done on their capital, but at the present time there does not seem to be that element of speculation. Never were payments more prompt, and, as I have said, we have several times a week offers to pay cash with the order, showing a total lack of speculative influences in the business being offered. Vesselmen are said to be figuring on 24,000,000 tons of ore the coming season. They are 1,000,000 tons short if the ore can be handled."

The plant of the J. C. McNeil Boiler Co., Akron, O., has been sold for $37,000. The plant has been in the hands of J. B. Campbell as receiver since 1893, and has prospered for the past four years. Harvey Musser, of Akron, representing the largest creditor, bought in the plant, and he will organize a company and continue operations on a larger scale.

THE DAVIS DOUBLE-COMPRESSION COUPLING.

The cuts show a new shaft coupling intended for the larger sizes of shafting, where a great amount of power is transmitted and is intended for line shafting from 3 to 8 inches in diameter. Fig. 1 is a view of the coupling complete and Fig. 2 illustrates the device in detail. The coupling proper is a rim with arms supporting the hub, which is turned tapering and cut in three equal parts. There are four compression flanges bored the same taper and fitting the tapering hub. The coupling is first put on the two pieces of shaft, each shaft being pushed into the center of the hub. The first two compression flanges are drawn up securely by three bolts. The two outside flanges are then drawn on by three bolts running through the four flanges, but drawing only the two outside flanges, thereby securing a very powerful compression, sufficient to drive any line shaft for which they are intended.

These couplings have a hub sufficient in thickness to cut a keyway, which allows the use of a key or feather to be placed in the shaft, where parties using them so desire. One of the features of the Davis coupling is the ease with which it is put on the shaft and good alignment secured, as any slight bend of the coupling can be corrected by tightening the bolts on the high side of the shaft. This feature will be appreciated, as the ordinary flange coupling cannot be made to run true unless keyed on the shaft and then faced. The time required in fitting up the ordinary coupling is often nearly as expensive as the first cost of the parts.

To remove the Davis coupling, the bolts are taken out and each of the three is screwed into holes tapped for that purpose in the compression flanges, which forces the flanges and the hub apart, when the coupling can be slipped off. The tapped holes are clearly shown in Fig. 2. The flanges cover the bolt heads and nuts so there is no liability of catching belts or clothing that may come in contact with the coupling when in motion. The manufacturer is the W. P. Davis Machine Co., Rochester, N. Y.

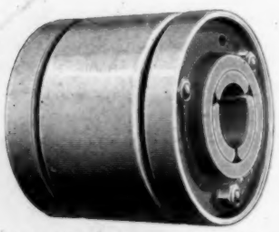


FIG. 1.—DAVIS DOUBLE-COMPRESSION COUPLING.

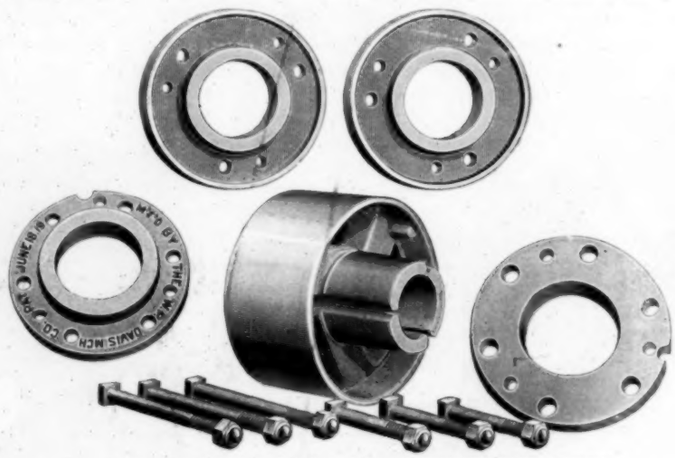


FIG. 2.—DETAILS OF DAVIS DOUBLE-COMPRESSION COUPLING.

At the annual meeting of the stockholders of the Monterey Steel & Iron Works, at Monterey, Mexico, the following board of directors was elected: Eugene Kelley and Antonio Basageiti, of New York city; Thomas Braniff, Leon Signoret and Francisco Izaguirre, of the city of Mexico; Isaac Gerza, Vicente Ferrera, A. Zambrano and Valentin Rivers, of Monterey. This company has a capital stock of $10,000,000, and the work of constructing the steel plant at Monterey, already described in these columns, is progressing rapidly. Several departments of the plant are already in operation. At present all of the coal used is imported from the United States by way of Tampico, Mexico. The company has secured extensive coal lands in Northern Mexico, and the new coal mines will be opened at once and developed.

The C. M. Horton Iron & Steel Co., of South Bend, Ind., was granted a New Jersey charter last week with $200,000 capital. A. J. Hammond and C. M. Horton, of South Bend, Ind., and D. A. Coulter, of Frankfort, Ind., are the incorporators.

BRITISH MACHINISTS REJECT PROPOSED AGREEMENT.

In our last issue we gave the text of the proposed new working agreement which had been drawn up in London, Eng., and endorsed by the Employers' Federation (machinery manufacturers) on the one hand and the officers of the Amalgamated Society of Engineers, the Steam Engine Makers' Union and the Machine Workers' Union, on the other hand. This agreement, having been approved by their representatives it was presumed the men would ratify it. But the contrary has proved to be the case. Our English exchanges say that the result of the voting shows a rejection of the amended terms proposed. The figures are not given for the three organizations, but in the case of the Amalgamated Society of Engineers, the most important of the three, only about 22,000, or 27 per cent of a membership of over 80,000 recorded their votes. Of this number 7,379 were in favor of acceptance and 14,879, or twice as many, against.

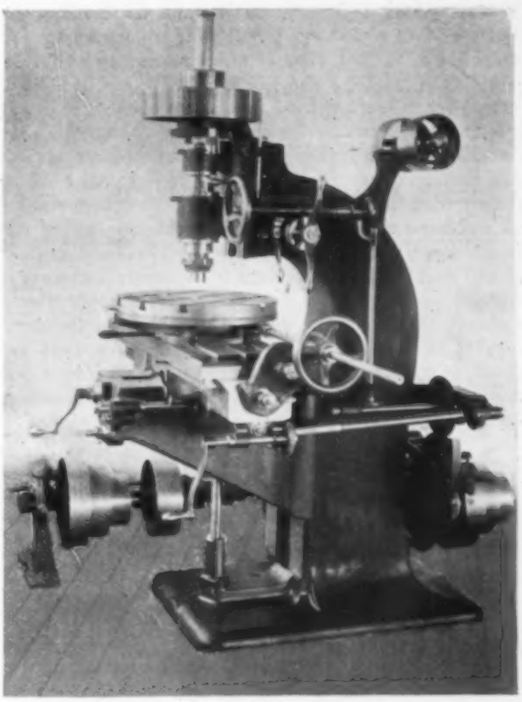
It will be recalled that freedom of employment, and no restrictions on piece-work or output, were cardinal points in the agreement. To understand its terms we must go back to the engineers' struggle of 1898, when the men were compelled after a memorable fight to go back at their employers' terms. The *Mechanical Engineer*, of London, says of the terms of the settlement in 1898, and of the recent effort to modify that agreement:

"The employers' terms in 1898, it was thought by the men's representatives, were somewhat harsh in their nature, and to some extent in the nature of victors' terms wrung from the vanquished, and the question of a more amicable rearrangement has been the subject of discussion for a considerable period between the conferences of the men's officials and the Employers' Federation, the final upshot being the recent agreement; and although not put forward by the trade unions officials as being everything they would have liked, were yet put forward by them as being terms which the men might accept. Presumably they are an improvement on the existing terms which regulate the relations between employer and employed in federation shops, since the employers have been quite willing to continue on the terms they exacted at the end of the strike and lock-out; and it has been at the initiative of the men's officials, and with a view to secure harmonious relations in shop management, that the recent conferences and revised agreement have been proposed. The terms of this amount practically to a clear enunciation of freedom of management on the part of the employer as regards the employment of machinery and operatives to mind them, as well as in the engagement of apprentices and non-society workmen. The removal of all restrictions as to output, and the adoption of piece-work, were mutually agreed upon. On the other hand, the employers undertook not to prejudice any man on account of his belonging to a society, or to institute piece-work prices which should undercut recognized trade union rates of wages. Another important point insisted on was that local strikes or lock-outs should not be initiated without reference to headquarters in London on both sides.

"The rejection of the agreement by the ballot of the men is capable of several interpretations; either that the vast majority of those who voted think the terms are not good enough, or that they prefer things to remain as they are as being better than the new state proposed, though it is somewhat difficult to believe this, seeing that the terms put forward have received the acquiescence of the union officials, which they scarcely would have done had they thought it would have placed them in a worse position. Another explanation may be that a feeling of pique has been created in certain local centres where subordinate officials have recognized that by the new arrangement their powers of running a strike, and hence their local importance, would be seriously curtailed by the control which would be exercised by the chief executive, and that as a result of this prospect they have used their special influence to whip up votes against acceptance of the proposed terms. Anyhow, it can hardly be said that the men have improved their position by the attitude of disapproval of their representatives, which their voting signifies. The Employers' Federation are not likely to amend the position they have taken up to any material extent, and the fact that only about one man in four has expressed his opinion by vote does not suggest a burning opposition that would end in a strike for which, in fact, the conditions of the labor market and trade outlook are not propitious, and which if indulged in could only end in defeat and disaster to the men. The vote therefore, in our opinion, only means that things will continue as before, and that the employer, if anything, will retain greater freedom than he would have done had the proposed agreement been accepted."

BLAKE & JOHNSON VERTICAL MILLING MACHINE.

The manufacturers of this machine were among the first builders of vertical millers of the old type, and their product has been gradually improved and redesigned. The latest form is illustrated in the half-tone. This is the No. 5 machine and it is well built and carefully proportioned. A special rotary attachment with a circular table, indispensable when milling any circular or curved work, is shown in position on the platen. The spindle is back-geared 5 to 1 and is fitted with a well designed ball-bearing to receive the thrust, and the lower part of the spindle has a taper hole to receive a cutter arbor or collet, which is securely held in place by a nut on the threaded end of the spindle. This thread may also be used for screwing on large cutters direct. The driving pulleys on spindle are independently mounted in solid adjustable bearings. The head can be adjusted vertically and locked at any point; it is provided with a micrometer, which makes an accurate stop when feeding the spindle. The platens are operated by screw feeds in either direction and all such screws have graduated dials; the platen feeds are derived from compounded gears accurately cut. The feeds of the platen, the



VERTICAL MILLING MACHINE.

head and rotary attachment, are all automatic and are driven by friction wheels, which give any possible combination of feed for each change of spindle speed, a feature of great value in the economical production of milled work.

The main dimensions of the machine are as follows: Platen 48x13 inches with 42-inch traverse and 14½ inches automatic cross feed; vertical feed of spindle, 7½ inches; main bearing of spindle, 3 inches; diameter of rotary table, 22 inches; floor space, 60x66 inches; net weight of machine with countershaft, 3,950 pounds, to which may be added 300 pounds as the net weight of the rotary attachment, which is supplied separately. The machine is fitted to a No. 11 B. & S. taper and will take a 4½-inch belt. It is manufactured in other sizes than the one selected for description, by Blake & Johnson, Waterbury, Conn.

Cooper, Hewitt & Co. expect to blow in Pequest Furnace, Oxford, N. J., in March.

Modern Machine Methods.*

BY H. F. L. ORCUTT, LONDON, ENG.

(Concluded.)

Turret Machines.

The leading characteristic of the modern screw machine or turret lathe is its adaptability for comparatively short runs. Largely on account of this feature it is rapidly encroaching on the field formerly held by the lathe. The lack of skill and training in properly maintaining and using turret machine tools is the greatest obstacle to its more extensive use in all classes of manufacturing, both of the automatic and hand type. It is preeminently the machine demanding the brains and skill of the high-grade toolmaker, a functionary wanting in 80 per cent of our engineering establishments. A large amount of lathe work now done by skilled men is sure to be shortly done on the turret machine by comparatively unskilled attendants, who will eventually beat the trained turner in respect to output, accuracy and uniformity. This applies to work like studs, bolts, cast-iron and brass parts. Where a good toolmaker is available, it pays in many cases to set up the turret machine for, say, twenty parts when operated by hand, and for several hundreds when machine is fully automatic. The author is aware that in many cases the turret machine has been and is a failure in competition with hand labor on simple machines; but he is sure that this is often where a low standard of workmanship exists, and where interchangeability is practically unknown.

In brass goods, especially, the demand for cheap work is rampant, and, of course, the supply of it is not wanting. The introduction of the best class of turret machinery would assist to put on the market a superior article at very little, if any, advance over the rubbish now sold, where the loss of even the simplest part necessitates the purchase of an entire apparatus, so little is interchangeability practiced. The great advantage in the modern turret machine lies in the possibility of using operators who, in a few weeks, can turn out accurate uniform work in competition with lathe hands who have served several years' apprenticeship. The common disadvantage to the modern turret machine is the lack of toolmakers, who are necessary for keeping machines in good working condition, and the almost universal want of understanding on the part of employers of the value of such men, no matter what wages they may command. For this reason turret machines, which are an unqualified success in one shop, are often condemned as useless in another.

The variety of turret machines, both hand and automatic, is large; simply to enumerate them would require too much space. The subject is an important one, and in spite of that which is a bugbear to many manufacturers—investment in tools—these machines are slowly but surely encroaching on the field now so largely held by the plain lathes operated by skilled turners, using, in most cases, simple tools.

Vertical Boring Mills.

The loss of time and inconvenience suffered by many shops for the want of a vertical boring mill is considerable. In many respects this machine is nothing more than a surfacing and boring lathe "stood on end." When fitted with a turret slide it forms a machine whose virtues are too little known. Like its horizontal prototype, it suffers from the lack of care on the part of intelligent toolmakers. With properly-arranged tools its field of usefulness is very large.

The small type of machine with 27-inch or 30-inch face-plate and turret slide is especially adapted for chucking operation, for the boring and accurate finishing of holes to limit-gauge, and also for facing operations. Work is rapidly chucked, the successive tools are quickly brought into play, and one man can, in most cases, attend two machines. For general work the vertical mill has the advantages of extreme rigidity and the ease with which work is set and held in place. With these features heavy cuts are possible, and inaccuracies do not occur on account of "overhang." It is practically impossible to construct a horizontal machine with spindle surfaces and face-plate rigidity that can compare with the vertical mill. It is now made with nearly every feature common to the lathe where a tailstock is not required; it is adaptable for boring, facing, and turning, and is provided with full sets of change gears for thread-cutting. It is not infrequently the case that one vertical boring mill does the work of two facing lathes, while giving more accurate work and effecting a considerable saving in shop spaces.

*Paper read before the Institution of Mechanical Engineers, at London.

Drilling and Jig Work.

Drilling is prehistoric as a mechanical operation and still flourishes in its primitive glory in a great many manufacturing establishments, as far as far as equipment of machines and tools is concerned. As previously mentioned, a large manufacturer recently told the author that on going into the matter of adopting limit-gauges and a modern set of chucking or boring tools, he found that a round hole was not made in his works. Like many others, he had never thought that "drilling" was a class of work which should be specialized as much as milling, turning, or any other operation. In many shops, where it would be found profitable to overhaul the drilling department, one would find (1st) the cheapest machines that can be bought having power enough to revolve the spindle when boring the maximum hole of their respective capacity; (2nd), the cheapest drilling tools that can be purchased (or forged); and (3rd), a total absence of jigs or sets of tools, even when parts are made in quantities or accuracy is desirable. Strictly speaking, to do work better than "good enough" is wasteful, but it is surprising to what an extent the nominally "good enough" principle alone rules,

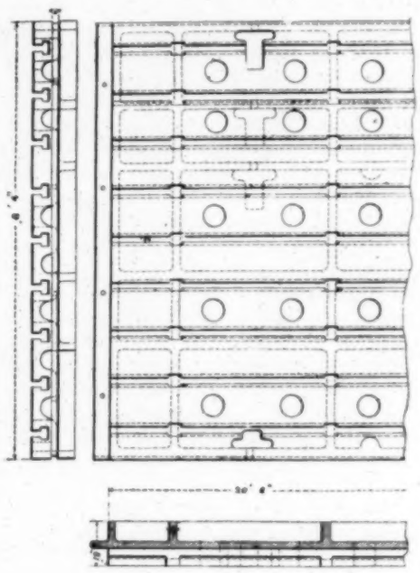


FIG. 5 —END OF ONE SECTION OF FLOOR PLATE, 175′ X 20′ 6″.

even in the many shops where the best class of drilling would be cheapest, all things considered. The many advocates of the cheap drilling machine would do well to note that it is economy to do better work in drilling and boring than is commonly supposed; that cheap, rough work can be done on a good drilling machine, and that good, cheap work cannot be done on a cheap drilling machine.

Weight and price alone considered, there is no machine tool on the market to compare with what can be purchased in the shape of a drilling machine; this is the temptation to continue in the old way. Those who would work on modern lines must, however, consider where interchangeability and good work are called for; the far-reaching economy of having holes truly cylindrical and accurate to size; that such holes cannot be made on cheap, low-priced drilling machines, with primitive drilling tools; that it pays many times to take work away from the drilling machines entirely, and to finish holes on the modern chucking machine; that satisfactory results from jigs and fixtures unaided by the accurate drilling machine, are out of the question; that with proper jigs and fixtures the highest class of work can be done on the good drill by the lowest-paid labor, and that this means savings in the fitters' work. A good deal of work formerly thought to be only possible on the horizontal boring mill is now being

jigged on the upright drill with profit, even for small quantities—drilling, reaming, facing and tapping.

The usefulness of the drilling machine is greatly extended by properly-designed jigs, and it is in connection with such tools that the greatest benefits of the accurate drilling machine will be realized. Many jigs, however, are the merest makeshifts, and are seemingly designed as rough laying-out boxes or plates, not as tools for turning out accurately-finished work. What are fully as important as the jig itself, but wanting in the majority of cases, are proper boring and finishing tools. It is probably true that, except by the sewing machine, small-arms, ordnance and ammunition makers, the economy of the drill-jig is, with but comparatively few exceptions, little understood; perhaps this accounts somewhat for the continued prosperity of the makers of cheap drilling machines. There are surprising results awaiting those who have not looked into the detals of their drilling work.

Portable Machines.

Like many other mechanical operations, portable machine work is not new, but it has recently been extensively developed in large engine works and in the manufacture of electric motors and generators. It is, of course, mainly applicable to heavy work, particularly of bulky or weighty parts where the surfaces to be machined are small compared with the part itself.

For a great deal of this work, it is found cheaper to carry the machine to the work rather than carry the work to the machine. Where it is most completely carried out, floor plates of large area are made use of. The General Electric Co., at Schenectady, N. Y., have one plate 175 feet long by 20 feet 6 inches wide. This is made up of sectional plates 8 feet 4 inches wide by 20 feet 6 inches long. The depth to the bottom of the ribs is 10 inches. In new works now being erected by the Allis Engine Co., floor-plates 250 feet long are being made.

Nearly all modern portable tools for heavy work are driven with separate electric motor. They consist mainly of drilling, milling, slotting, and planing machines. All are arranged with eye-bolts, so that they can be readily lifted by overhead travelers. Many of the machines are of far less weight than the parts on which they operate. The principal advantages connected with their use are:

1. The ease and facility with which they are transported, compared with the parts on which they are operating.
2. A less expensive machine is possible than would be required in case it was big enough to embrace the parts.
3. Tools are rarely idle, as they can be operating upon one piece while another is being set, and can be brought at once to the work.
4. Several machines, like boring, slotting, milling, etc., can be operating on one piece at the same time.
5. Parts do not require resetting for different operations, often more expensive than the machining itself.

Small Tools.

The small tools referred to are those which are indispensable to the successful working of ordinary machine tools; for example, cutters, reamers, taps, dies, arbors, boring tools, and gauges. It is remarkable how little attention these important articles receive even from those who are users of the best class of machinery. Many a valuable labor-saving machine tool is an utter failure, or only half a success, largely on account of ignorance in selection or care of the tools. Throughout the world there is a scarcity of toolmakers who understand these little articles. The labor-saving machine is nothing without them, yet scores of manufacturers have capital sunk in badly-designed, inaccurately-made, uncared-for, never-inspected small tools. The subject is a big one, and space allows but brief mention of the questions that the modern manufacturer should put to himself: Are the small tools of the right design, so that cuts are easily taken without too severely exerting either operator or machine? Are they well-made, and within reasonable limits of accuracy? Without accurate tools it is impossible to employ low-priced wages for high-grade work. Are they made of the best material, having in view wearing qualities on a particular class of work? Are they kept in the best working condition, sharp, and in good repair? Output and quality will fall off if they are not. Are they "scrapped" when past their useful age? Are they cared for in well-arranged tool stores, or does each workman foster his own "kit," add to, take from, sharpen, repair, and inspect? It is safe to say that many shops are stocked with ten times as many tools as are necessary, simply for the want of proper stores. One large shop recently found that two tons of tool-steel could be dispensed with by arranging tool-stores, instead of allowing each man to retain his own complete outfit. Better cut down the quantity and improve the quality. Are they ever inspected? How many taps or reamers cut to size? How many arbors run true? How many teeth in milling cutters cut? How many gauges guaranteed to 1-1000 inches when new (note the degree of accuracy) are no longer accurate to 1-100 inches, are neither round, square, nor oval? How many "home-made" tools are nearly as good as those that reliable makers can supply, or as cheap? Last, but not least, how many establishments have a good head toolmaker who is familiar with the latest practice, knows the best forms of tools for different classes of work, and appreciates the value of keeping tools in the best working conditions? How many take the trouble to train such men, give them the opportunity of studying what others are doing, or pay them sufficiently to induce them to put their brains and intelligence into this work which demands thoughtful application and the highest mechanical skill? Modern manufacturing cannot be carried on unaided by well-cared-for cutting tools of the best quality. The higher the output per machine and man, the greater the importance of the tool question.

Tool Room.

By the term "tool-room" is meant an equipment of the best grade of machine tools and small tools necessary for the maintenance and supply of the special tools and fixtures which are used for manufacturing purposes. In an old-fashioned plant this equipment might mainly consist of a forge and a grindstone. In a highly-organized plant making an extensive use of labor-saving machines, fixtures and jigs, it must consist of the most accurate machines, such as the universal mill, engine lathes, shapers, boring machines, drills and grinding machines, and also of accurate gauges, the equipment varying in size and variety in accordance with the main plant.

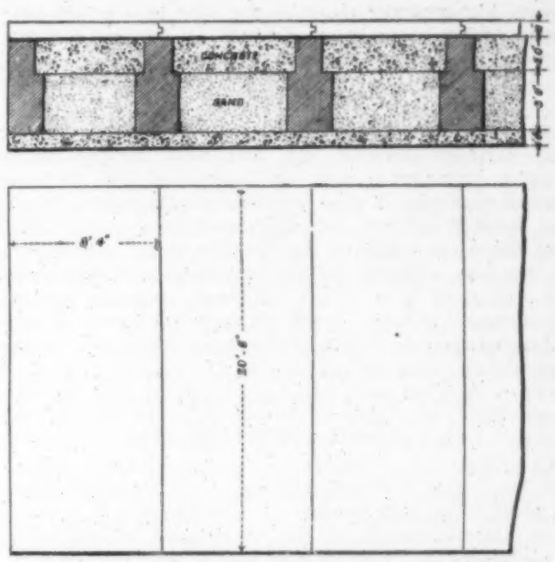


FIG 6.—FOUNDATION OF FLOOR PLATES AND SURFACE PLATES.

It seems curious, but it is a fact, that many manufacturers do not realize that complicated labor-saving machines and tools, constituting a highly-productive outfit, rapidly degenerate unless the means are at hand for constantly regenerating. They will invest in expensive machines, which plain figures show are profitable, but will leave works, managers and foremen nearly destitute as to the means of keeping up the plant. The object of fast-working machines and accurate tools is to save hand-labor. Labor-saving outfits fail in a measure to replace hand-labor if accuracy is lost sight of. Cutting tools will wear, and, whether they are adjustable to gauge or of

fixed dimensions, the allowable limits for wear are really very small, if we expect labor-saving tools to compete with the skilled worker. The need of constant renewal is obvious. To attempt this renewal unaided by the very best appliances is uneconomical.

Many manufacturers attempt tool-room practice in a groping sort of fashion, a lathe here and there, a milling machine occasionally made use of when not employed in regular work, and a standard set of gauges purchased in an unguarded moment, and carefully kept in the office under lock and key. A few who have fairly good outfits make the mistake of turning their tool-rooms into manufacturing establishments of those articles which could be purchased more cheaply and better from a trustworthy maker. Those who proceed on this plan are liable to be constantly behind in respect to the latest design of tools, for the reason that they come so little in contact with those who make a special study of tools, and the best ways of producing them.

Others have a vague sense of the need of a tool-room, but do not see that this equipment calls for everything of the best. They try to economize in the purchase of outfit, and must surely therefore only attain indifferent results. None but machines of the highest accuracy should be allowed in the tool-room. The worst offenders of all are those who try to economize the wage account chargeable to tool-room. The very best skill and intelligence obtainable should be employed in this department, for on it rests a good part of the responsibility of producing a large or small output. Whether the plant is highly productive or not largely depends upon the head toolmaker. To expect brains and intelligence of a high order to seek employment where the wages are low is contrary to all laws of supply and demand. American manufacturers, who generally recognize the value of a proper tool-room, commonly pay from 12s. to 16s. per day, and even 20s. per day, for good tool-makers.

Erecting Department.

Probably in no department of mechanical work are the contrasts between old and new methods more striking than in erecting or assembling. In the new method machining is done accurately to dimensions; in the old, machine and tools are mainly used for removing metal, and reliance is placed on the fitter for proper working fits. In the new, accuracy and interchangeability of dimensions are maintained by a suitable equipment of gauges and the establishment of limits; in the old there is a variety of sizes depending upon the skill and judgment of individuals. In the new, the time necessary for "setting up" a particular piece of work, or "lots" of work, is reduced 25, 50 per cent, and even more, below that taken in the old shop. In the new, the number of fitters is strikingly small compared with the abundance of this class of helpers necessary in works running on old lines. The model erecting department, therefore, is one in which fitters' work is reduced to a minimum, and where the least possible amount of time is occupied in assembling. These results are, of course, only possible when the best methods of machining are practiced, when jigs and fixtures are used as much as possible, when a proper equipment of gauges is installed, and a system of inspection is amplified.

Testing and Analyzing Material.

In view of the fast machine operations, the increasing demand for accuracy, and the exacting requirements in respect to material under which the engineer often has to work, it is wonderful how little the ordinary manufacturer really knows about the structure, composition, and capabilities of the material which he is continually buying, manipulating, and selling. A testing machine here and there (crude enough as a rule), a few laboratories connected with schools and scientific public institutions; the rest is guess work. A change of foundry foreman, or the transfer of patronage to another steel-maker, often demoralizes a whole establishment, results in the ruin of expensive machines and tools, and in the scrapping of costly finished product.

The advantages of possessing a well-equipped laboratory and testing department are many and far-reaching compared with the sole disadvantage—expense, and they bring quick returns for a small outlay. In the first place, raw material, pig iron, scrap, coke, steel, copper, brass, etc., should be bought to specification. The result would be emancipation from the slavery of "brands." This in itself is a considerable advantage to the buyer. A control of cupola mixtures can also be undertaken which will give definite results in castings. Steel, iron, and other materials can be selected independently of the recommendation of the maker, who too often answers a complaint with the assurance that more expensive material must be purchased, when perhaps cheaper would be better. Not alone in the purchase of material, but in the manipulation as well, is the analyzing and testing engineer of value. Castings must be properly treated, and be of the right mixtures to allow rapid and accurate machining. Recently a case came under the author's observation where the product of a milling machine was increased 30 per cent, simply by improvement in the quality of material. Many concerns are using hard material which is necessary for certain parts but uncalled for in other cases, because they have no definite knowledge to enable them to vary cupola mixtures. If they had they would increase the speeds of machining in a large percentage of their work. Materials should be studied with a view to selecting that which is most suitable for the purpose, bearing in mind its suitability for being rapidly machined, and which, fulfilling all conditions, is the cheapest. This cannot be accomplished with the haphazard methods commonly employed. The establishment of laboratories is confidently put forward as a suggestion worth the serious consideration of mechanical engineers. It will pay in nearly all cases for those employing 1,500 hands, in a majority of cases for those employing 1,000, and in some cases where under 1,000 are employed.

Where the size of a shop does not warrant the expenditure necessary to support its own department, several manufacturers can easily combine and contribute to the support of a fully-equipped laboratory. Where the last course only is feasible, petty jealousies and nonsenical isolation, which are so prevalent among manufacturers, will probably stand in the way for some time to come. There is, however, no practical reason why every mechanical engineering establishment in the United Kingdom should not have a testing institution at its command which could be constantly made use of. The realization of this state of affairs would be of incalculable benefit to the industries and commerce of Great Britain.

The following table (III.) of chemical specifications is one suitable for a large variety of light machinery castings which can be rapidly machined, are close grained, have good wearing qualities, and take a good finish:

TABLE II'—CHEMICAL COMPOSITION OF LIGHT CASTINGS (IRON

	A. Mixture for Thin Castings under ⅜-In. Thickness.		B. Mixture for Castings of an average Thickness of ⅜ In.		C. Mixture for Castings 1¼-In. to 2-In. Thickness.	
	Limits Allowed.	Analyses Desired.	Limits Allowed.	Analyses Desired.	Limits Allowed.	Analyses Desired.
Silicon	2.45 to 2.65	2.55	2.30 to 2.50	2.40	2.15 to 2.35	2.25
Sulphur	0.07 to 0.10	0.08	0.07 to 0.10	0.09	0.09 to 0.12	0.10
Manganese	0.30 to 2.70	0.40	0.30 to 0.70	0.40	0.30 to 0.70	0.40
Phosphorus	0.70 to 1.00	0.90	0.50 to 0.90	0.70	0.40 to 0.80	0.60
Combined carbon	0.30 to 0.50	0.40	0.30 to 0.50	0.40	0.30 to 0.50	0.40
Graphite	2.90 to 3.20	3.10	2.90 to 3.20	3.10	2.90 to 3.20	3.00

For very heavy castings a mixture containing about 2.00 silicon should be used; other elements same as mixture C.

Shop Fittings.

Good fittings play a not unimportant part in shop economics. They are too often looked upon as articles of luxury, only to be made use of by faddists, instead of as possessing a practical value as means of saving time and maintaining order and cleanliness. Among the more important are included: well-designed work benches, shop stands for workmen who are machine attendants; cans and buckets for waste and rubbish; properly-designed racks for holding parts; carefully arranged receptacles for tools and gauges; and racks for holding rough material. Stores for rough materials, partly finished work and finished product should be most carefully

studied. Simple and easy methods of fastening countershafts and main shaft hangers should be devised. Means of transportation—whether cranes, railways, or trucks—should, of course, receive special attention. Machine-shop floors deserve far more thought than they usually receive. Means of heating and ventilating are, as well as floors, absolutely essential to the modern shop, for without them it is impossible to properly keep fine machines, tools, and gauges in good condition. Comforts and conveniences for workmen are fast becoming necessities in the modern shop, as they help in attracting and retaining the best and most intelligent work people.

Organization.

Most shops, even the newest, are in a way organized without much analysis or systematic study of the latest methods. Volumes have been written on shop organization, and there is room for more volumes. Every item which it is proposed to mention here is capable of being expanded into a separate treatise. The main items which must receive attention from the modern manufacturer are as follows:

1. The adoption of the most economical methods of manufacturing, and machines best adapted to the product, as well as the best forms of small tools and proper gauges.

2. The specialization of manufacturing operations, both in respect to equipment and supervision. This is largely regulated by the quantities that are to be made. Where the quantities are small, different parts must go through the same sets of machines. Where transportation would be costly on account of weight of parts, or the quantities are large, separate parts may command a complete outfit. Care should be taken not to have too many machines or varieties of work under one foreman. Many successful manufacturers state that no foreman should have charge of more than forty to fifty men.

3. The placing of departments in the best positions relative to each other, so as to facilitate transportation and progress of work.

4. The possession of shop fittings and structural features best adapted to product and to the comfort and convenience of work people. How far an investment in this direction will pay cannot always be shown in cold figures, but the recognition of its importance is growing, and several modern manufacturers have installed elaborate arrangements without the slightest claim to philanthropic motives in all that they have done for their employes.

5. The installation of a system of inspection by which quality of product is kept within desired limits. This is strangely and commonly neglected, but it naturally follows the adoption of modern machining operations which are largely performed by unskilled men, using the best forms of cutting tools and gauges and producing interchangeable work. "Every foreman his own inspector" is no longer workable in the modern shop.

6. The adoption of methods by which exact costs of product are known and work in progress is constantly under control. "I fear no competition except from those who do not know what their work costs them," said one manufacturer. "I try to make a date of delivery gospel," said another. Needless to mention, both the above are rare specimens of shop managers.

7. The establishment of a system of training and instructing employes. Most manufacturers work on the Micawber principle of waiting for "something to turn up" in the way of skilled employes. This is slipshod, unsatisfactory, and short-sighted. It is the natural concomitant of badly-equipped, poorly-arranged, comfortless, and low-waged establishments, having no features of equipment or management sufficiently attractive to retain an intelligent, self-respecting workman after he is well trained.

The best selected plant is often but a partial success, and not infrequently a total failure, for the reason that it is put down without sufficient consideration in respect to organization. The author is being repeatedly told by manufacturers that certain machines, which he knows are effective labor-savers in constant operation, would simply be smashed to pieces if they tried to put them to work. This might occur, chiefly for the reason that their shops are arranged utterly regardless of the fact that it pays to specialize operations, to group machinery according to the nature of the work, putting over each group a competent foreman, who thoroughly understands the class of work which he is supposed to supervise. The majority of shops, in their effort to eliminate high-waged employes (always the most profitable) employ too few foremen. They put one man over too great a variety of work, and give him too many men to supervise. From forty to fifty men is the ordinary limit for a good foreman. Many shops have one foreman in charge of as many as 150. He must be a combined expert in turning, milling, planing, grinding, etc., do his own tool-making, cost-keeping, and inspecting, all for 50s. a week. This is an incomprehensible situation, no matter what salary may be paid, demanding an experience and training impossible of attainment in these days of "second-splitting" operations performed on highly-developed machines. Specialization of operations, as well as of product, is necessary for the most economical manufacturing. When work is classified in accordance with the best practice, viz., having its plant arranged with a view to a thorough supervision on the part of foremen, having an orderly progress of parts, cheaper and better work will be the result, and responsibility can be more easily located in the case of mistakes.

Extensive Application of Modern Methods.

There is a widespread and erroneous idea, particularly among European manufacturers who would emulate American manufacturers, that the latest methods cannot be economically adopted except where work is thoroughly standardized, specialized, and made in large quantities. Advantage of every method which has been mentioned, with the exception, perhaps, of jig and fixture work, can be taken where none of the above conditions exist, not even excepting that which practically amounts to interchangeability. One hole is more cheaply bored in a chucking machine than in a lathe. It is more easily made to a limit-gauge than when the skill of a workman in setting his calipers has to be trusted. One spindle is more cheaply finished in the grinding machine than in the lathe, quality duly considered, and again is more easily finished to a limit-gauge than to calipers, with the employment of less skillful labor. With the quickly-adjusted, easily-manipulated milling machine, any amount of work can be more cheaply milled than planed, even where only a few pieces are to be worked. Inspection, good equipment of gauges, tool-stores, the latest machines and small tools are necessary, whether one piece or 1,000 are in question.

The idea that big quantities and standard work are necessary before modern equipment begins to play an important part in the economics of manufacturing is the delusion of those who have grasped but a small part of the problem.

The Apprenticeship Question.

Unquestionably one of the most serious obstructions to the introduction and successful working of new machines and methods is the lack of knowledge and understanding of modern machine methods on the part of workmen. This is not due so much, as is commonly supposed, to the restrictions and regulations of trade unions, as to the ignorance, bad management, and want of foresight on the part of the masters. The fact is that men in a great many shops accomplish wonders, considering the opportunities given them to learn, and the appliances with which they are expected to work. Within a comparatively short time, methods of manufacturing, machines, and tools have undergone an almost revolutionary change. This change has been so great and rapid that men, who served as apprentices under the old regime, are ignorant of new methods, and have not the necessary training to manipulate successfully and supervise the most economical working machinery. Many of them are as much at home in a really modern shop as Alice in Wonderland. It is not at all surprising that they shake their heads at strange new machines and doubt the tales of the American "Mad Hatter." It is well to ask the masters who grumble, if they themselves are familiar with the latest methods of machine work; if they are familiar with the advantages of the subdivision of labor and departmental work; if they know the value of skilful, intelligent toolmakers, and are familiar with the best machines and appliances. These are items which must be studied by the masters; and

side by side should be considered: How shall they instruct and train men in the proper use and care of machines and tools? In other words, systems of apprenticeship must be inaugurated and maintained which teach men how to work in modern ways. Do not work apprentices on old-fashioned machines with out-of-date tools, letting them take years to learn to perform certain operations which a man from the street with three weeks' practice can do better and quicker on a modern labor-saving tool. Many shops are having endless trouble from trying to work new machines by men trained on the old lines, neither masters nor men comprehending their duties. It is the duty of masters to establish modern systems of apprenticeship arranged in accordance with new methods. It is the duty of men to try to adapt themselves to these new systems. It is wasteful and foolish for all to insist that a man must serve from four to five years before he can become a proficient turner, when we know that in a few weeks a laborer can learn to operate two grinding machines and produce cylindrical surfaces that it is impossible for the most skilful turner to duplicate, either in regard to quality or cheapness. This is not saying that it is unnecessary to train men to become good turners; it is, however, unnecessary to train them to perform many operations which are superseded by new methods of working. The same comparison can be made between the screw machine and the lathe and the milling machine and the planer. Chuck and jig work supersede boring and drilling. Men must realize that the new ways have come to stay. Masters will wait in vain if they think the technical school can ever take the place of rational training in that best of all schools—the shop itself. Many employers are beginning to realize that there is but one way to get good men—that is, to make them. A modern system of apprenticeship naturally divides itself into three broad classes: 1. Training of men who wish to become skilful in special operations, like turning, planing, etc. 2. Training of men who wish to become merely machine operators. 3. Training of men who are necessary for supervising and keeping plant in a high state of efficiency. By the old methods men are largely trained to become skilful in turning out a certain product. By the new methods the highest skill is employed as supervisor of labor-saving machinery which turns out the product in a practically finished state. This calls for a radical change in the systems of apprenticeship.

Politicians and writers are raving over the technical schools of Germany. Speaking as one who has for years been in contact with the product of the German technical school, the author has no enthusiasm nor admiration for their methods; at least, as far as mechanical progress is concerned. Technical education as taught today is useless, except to a very small percentage of our mechanical workers. There is an immense amount of talk about scrapping old machinery, buying new plant, and planning new shops, while the most important factor of all—men—is left to shift for itself. Yet all are asking the question, "Where can I get good men?" "Train them," is the answer. The means for doing this are in the hands of every manufacturer. In your own shops, on your own machines, with your own instructors, in your own time; neither municipalities nor governments can do it for you. Manufacturers must establish systems of apprenticeship which include workshop experience under educational guidance.

The Classification Board of General Appraisers rendered a decision last week on a protest case of Dana & Co., of Boston, ruling that furnace sand, which is produced by grinding silica stone or sandstone, for use as a bed for furnaces as a protection from heat, is entitled to free entry upon importation under the provision for sand, crude or manufactured, in paragraph 671 of the Tariff Act. According to the testimony produced at the hearing before the Board the sand under consideration was for use in place of cement to fill up the interstices between the silica brick or stones used in furnaces, the object being to set the brick with the sand, each being of the same material.

The Laughlin Nail Co., of Wheeling, W. Va., is completing two additional sheet mills at its plant, Martin's Ferry, O., and will have them in operation within 60 days. At present four mills are in operation.

THE WELLMAN-SEAVER ENGINEERING CO.'S WORKS.

The new manufacturing plant of the Wellman-Seaver Engineering Co., Cleveland, which has been under construction for several months, is now practically completed and will soon be in full operation. The plant is well located on a site ample for present needs and future extensions, and is connected by switching tracks with all the main trunk lines entering the city. The buildings are notable on account of their great height, the wide spans of their main roofs, the large amount of light secured, and the solidity and permanency of their construction.

The main erecting and machine shop consists of one central span, 80 feet wide in the clear and 69 feet high from the floor to the underside of the roof trusses. Extending along one side are two gallery floors, each 45 feet wide, which with the ground floor under the galleries, gives three side floors. The main, or 89-foot span, is commanded by a number of 50 and 10-ton cranes. The heavy cranes traverse upon runways immediately under the roof trusses, and the light cranes upon runways directly beneath those of the heavy cranes. This allows of an independent movement of all the cranes, giving a very convenient arrangement for erecting work, placing the material on the heavy tools and handling same when in process of erection. The side spans are commanded by 10-ton traveling cranes. The second floor of the side spans, being reserved for the use of medium and light tools, is served by movable floor cranes. The third floor will be occupied by the Electric Controller & Supply Co., an organization closely affiliated with the Wellman-Seaver Engineering Co. Underneath the main span, at one end of the shop, are located the heaviest tools, and on the first floor under the side spans are the medium weight tools. The machine tools are of specially heavy construction to meet the latest requirements in high speeds and heavy service made possible by the recent developments in tool steels, and are equipped with individual variable-speed electric motor drives, there being an entire absence of belting and shafting in the shop. The construction of the machine and erecting shops throughout is strictly fireproof, the main framework being of structural steel with brick curtain walls and tile roof. The gallery floors are of steel and concrete construction. The windows and skylights are fitted with ribbed glass, giving an excellent diffused light. Special provision has been made for the heating and ventilating of the shops by the Sturtevant hot-air system. The ducts for the passage of the air are of heavy brick construction and are located beneath the main floors, the main conduits running longitudinally of the shops, with transverse ducts to the side walls.

The power building is also of fire-proof construction, and here are located the electric generators for light and power, with engines and boilers of ample capacity arranged in duplicate units, thereby ensuring continuous operation. The electric power consists of both the direct and alternating current systems, so that machinery constructed for either type of current can be thoroughly tested before shipment.

The building for the pattern shop is 50 feet wide by 165 feet long, of brick and wood construction. It is equipped with automatic sprinklers and other modern appliances for fire protection. The structure is three stories high; the pattern-makers occupying the first or main floor and the two upper stories being used for the storage of patterns. The building contains the very latest designs in pattern-making tools, electrically driven.

Plans have been prepared for a large combination iron and steel foundry, which will be erected early this year. This foundry is intended to be one of the most complete in the country and will be equipped with every facility for the production of exceptionally heavy iron and steel castings.

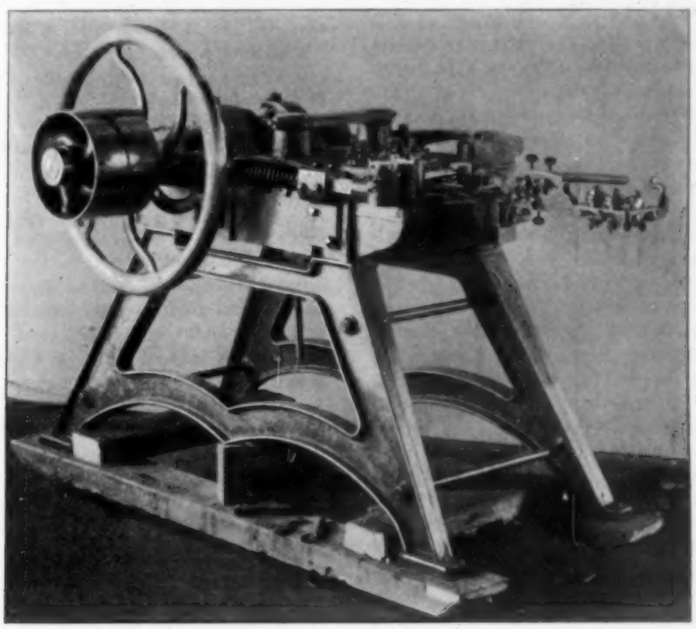
Special provision throughout the works has been made for the comfort and convenience of the employes. The toilet rooms are provided with the most recent sanitary appliances and provision is made for individual lockers.

The general direction of the plant falls to Thomas R. Morgan as secretary and works manager. Mr. Morgan was formerly connected with the Morgan Engineering Co. as secretary and general manager for many years. The general superintendent of the works is William A. Stevenson, formerly of the Stearns Mfg. Co., Erie, Pa. Mr. Stevenson will be

assisted by a complete staff of foremen and all the work will be turned out under a strict system of inspection and the manufacture of machinery carried on in accordance with the latest ideas in regard to interchangeability, all work being as far as possible from jigs and templates and in agreement with fixed standards. The plant has been laid out for the production principally of the Wellman-Seaver Engineering Co.'s designs in steel works and rolling mill machinery, such as special cranes, charging machines, charging cars and boxes, gas producers, valves, and open hearth and other furnaces complete. With this equipment of modern tools and cranes, coupled with the large experience of the various members of the company, it will be possible for the plant to handle and ship with expedition a very wide range of exacting and heavy machine construction, requiring precision in manufacture and design.

PERKINS WIRE NAIL MACHINE.

The wire nail machine manufactured by Henry Perkins & Co., of Bridgewater, Mass., is put on the market not as capable of the speed and output claimed for some machines, but as making an average output of the best product and as requiring comparatively little repair. The loss of time and the expense of repairs to machines speeded up to heavy outputs



PERKINS WIRE NAIL MACHINE.

are cited by the manufacturers of the Perkins machine as factors often overbalancing the gain in quantity of output.

The machine shown is built so as to put the dies in sight where they can be adjusted to the nicety required for fine work. It has a positive header and the pointers are operated from chilled path cams, in which, attached to the pointing levers, run hardened steel rolls. The gripper is moved from a chilled cam, on which runs a hardened steel roll, attached to the gripping lever. The feed is single or double as desired, the latter being a friction feed which leaves no mark upon the wire. Positive clearers of two or three styles are supplied. This machine is employed by makers of shoe nails and other special work which requires to be of a fine quality and it was designed by men with an experience of 10 years in the manufacture of wire nails of all styles from ⅜-inch No. 21, to 9-inch spikes. Machines are made in sizes to include all these.

The entire plant of the Chester Iron & Steel Works, Chester, Pa., was placed in operation this week. The angle mill has been in operation for some time. The output of the plant will consist of angles, bars, shapes and grooved skelp. The plant has recently been overhauled and a new machine shop, 35x60 feet added. Charles Dreifuss, of Pittsburg, is president, and H. H. Vandevort, manager.

ARBITRATION COMMITTEE OF THIRTY-SIX.

The first meeting of the Arbitration Committee of Thirty-Six, of the National Civic Federation, who are to arbitrate labor troubles, was held at New York, Feb. 19. It is remarkable that only six members of the committee were absent. Among those present were Archbishop Ireland, of St. Paul; Bishop Potter, New York; Samuel Gompers, president of the American Federation of Labor; Senator M. A. Hanna, of Cleveland; S. R. Callaway, president of the American Locomotive Works; H. H. Vreeland, of the Metropolitan Street Railway Co.; James A. Chambers, president of the American Window Glass Co.; John Mitchell, of the United Mine Workers; Frank P. Sargent, of the Brotherhood of Railway Firemen; Theodore J. Shaffer, of the Amalgamated Association of Steel, Iron and Tin Workers, and Cornelius N. Bliss. The absentees were Charles M. Schwab, president of the United States Steel Corporation; ex-President Cleveland, Lewis Nixon, J. H. Eckels, Daniel J. Keefe, president of the Longshoremen's Association, and Edward P. Ripley.

The day was devoted to the adoption of by-laws. These provide for annual meetings of the Industrial Department; for an executive committee of 36, of whom 12 shall represent employers, 12 employes, and 12 the general public. Officers are provided for and their duties defined. The important articles are 7, 8, 9, and 10, which are as follows:

Article 7.—Conciliation Committee. The chairman shall appoint a committee on conciliation, to consist of nine members, three of whom shall be selected from each group, whose duty it shall be, at the request of the chairman, upon information of threatened strike or lockout of more than local magnitude, to use its good offices in restoring harmonious relations, reporting its action to the executive committee.

Article 8.—Arbitration. Should the efforts of the conciliation committee prove ineffective, and should both parties to the dispute desire the services of the executive committee of this department, they may be invited to select two employers and two wage earners from said executive committee to serve as an arbitration board. Should the four find it necessary to appoint an umpire to finally decide the dispute, they may select a fifth member from the division representing the public.

Article 9.—Emergencies. Should a controversy seem of such magnitude as to justify such action, the officers of the executive committee shall be authorized to call a meeting of the entire executive committee to consider the situation and take such action as may, in its judgment, be required.

Article 10.—Auxiliary Committees. The executive committee may appoint auxiliary committees to deal with local dis-

turbances, the rules governing the same to be in harmony with the general purpose of the industrial department.

At the close of the meeting Senator Hanna, who was chairman, said: "The meeting was very satisfactory. Thirty out of the 36 members were present, and the spirit displayed was splendid. We feel delighted with the results of our efforts toward utter harmony between capital and labor." President Straus said that the greatest cordiality had been manifest during the proceedings, and that no differences of any kind had developed. "Both sides have looked at this question from a high plane," he added, "and, the best thing of all, perhaps, employer and employe have met together as man to man. We do not imagine that we shall bring about the millennium, but we shall certainly come pretty near averting labor troubles in the future. Just think of it, out of all the members there were only six absent! It is no little thing to be able to get busy men from all parts of the United States, representing large interests, to come together for a meeting of this nature."

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of their Wants:—

The Chicago Brass Co., of Kenosha, Wis., has increased its capital stock from $100,000 to $350,000. The increase in the capitalization is to provide for increased foundry capacity.

The Walton Iron Co., of Cincinnati, O., has been incorporated with $50,000 capital for the purpose of engaging in structural steel work. J. F. Walton, R. E. Sweeney, George Van Hogel, R. Z. Buchwalter and C. D. Robertson are the incorporators.

The Pressed Steel Specialty Co., of Woodbury, N. J., has been incorporated with $200,000 capital to manufacture pressed steel specialties. The incorporators are O. C. Knipe, John P. Knobeloch, L. E. Swint, R. C. Carlton, and John J. Kromer.

The Cherokee Foundry & Machine Co., of Cherokee, Kansas, has been incorporated with $20,000 capital.

The Steel Casting Co., of Boston, Mass., has been incorporated in Portland, Me., with $100,000 capital. C. F. Harwood, C. W. Noyes, C. P. Jameson, W. A. Carlton and D. A. Meaher are the incorporators.

The Sharon Foundry Co., of Sharon, Pa., recently incorporated with $250,000 capital to erect a foundry between Sharon and Wheatland, Pa., perfected an organization last week by electing Joseph Riddell, president, and Thomas Kennedy, secretary and treasurer. These together with Robert Bentley, W. J. and Frank Hitchcock, of Youngstown, O., are the incorporators. The new company will manufacture all kinds of rolling mill machinery as well as ingot molds and steel castings.

The Fairfield Car Wheel Co., of Boston, Mass., has been granted a charter in Maine with a capital of $500,000, for the purpose of manufacturing patent equipment for the manufacture of car wheels. Horace Mitchell and E. S. Abbott are the incorporators.

The California Tool Co., of Los Angeles, Cal., has been incorporated with $20,000 capital to manufacture oil-well supplies. J. A. Richardson, F. C. Richardson, M. A. Anderson and N. and A. Wauldie are the incorporators.

The Commonwealth Steel Co., 415 Locust St., St. Louis, Mo., has elected the following officers: James Hopkins, president; William F. Niedringhaus, first vice-president; J. S. Andrews, second vice-president; Louis J. Hayward, treasurer; O. S. Pulliam, secretary and general manager, and Charles T. Westlake, works manager. The company state it will build the largest steel foundry in the United States, which will be located on the east side of the Mississippi river, opposite St. Louis, and will cover a site of about 18 acres.

John Inglis & Sons, of Toronto, Ont., are putting up a new forge and enlarging their boiler shop to make room for 16-ft. rolls to bend 1½-inch plate; a 20-ft. plate planer and double the present air equipment, in order to keep pace with their rapidly increasing boiler business. Extensive additions to machinery in the other shops will probably follow.

The Battle Creek Iron Works Co., Ltd., of Battle Creek, Mich., has just organized and will erect a modern foundry and machine shop. There is a large amount of foundry work to be had from local concerns like the Union Steam Pump Co., and the new company expects to continue the manufacture of the specialties of the Hastings Iron Works, Hastings, Mich., which it has bought out. These include house sinks, registers, ventilators and hardware specialties. All the business of the Hastings company and its machinery and patterns have been acquired and the Hastings works will be continued until the new plant at Battle Creek is completed. The following board of managers of the Battle Creek Iron Works Co., Ltd., has been elected: P. T. Colgrove, chairman; M. S. Curtis, treasurer; S. Grensel, secretary; Clement Smith and Frank Bock.

The Chicago Brass Co., Chicago, has increased the capital stock from $100,000 to $350,000.

I. Preston Rice, manager of the Grand Rapids Malleable Iron Co., is interested in a project to build a foundry at Kansas City, Mo.

Angell & Fairbanks will operate a machine shop at Ithaca, N. Y., and are now purchasing equipment. Besides the manufacture of a new gasoline engine igniter the firm will make improved locomobile engines, wood patterns, models, and special machinery.

Lee M. Rumsey and George F. Speer have purchased the Fort Worth Iron Works, at Fort Worth, Tex. Mr. Speer says that the plant will be improved and enlarged.

The Shelby Iron Co., Shelby, O., may purchase the American Bicycle Co.'s plant at Shelby, O., and operate it as a chain and specialty works.

M. H. Treadwell & Co., Lebanon, Pa., desire to receive catalogues of mechanical equipment for foundry and machine works, as they are considering many improvements of their Lebanon plant which they have but recently acquired.

J. Martin will start a machine shop at Portland, Ore.

Fires and Accidents:—

The Wayne Agricultural Implement plant at Richmond, Ind., was destroyed by fire recently entailing a loss of $50,000. It will be rebuilt at an early date.

The plant of the Lima Steel Casting Co., Lima, O., was destroyed by fire on Sunday, Feb. 23. The loss is estimated at $50,000.

The plant of the George H. Smith Steel Casting Co., Milwaukee, Wis., was destroyed by fire on Wednesday, Feb. 19. The loss is estimated at $180,000.

The plant of the Hampden Corundum Wheel Co., Brightwood, near Springfield, Mass., was destroyed by fire last week. The loss is estimated at $50,000.

On Tuesday, Feb. 18, the plant of the Louisville Bolt & Iron Co., was destroyed by fire entailing a loss of $75,000.

The plant of the William A. Miller Co., 120 Pine St., St. Louis, Mo., builders of electric elevators, was destroyed by fire Feb. 15; loss, $10,000.

The office, pattern rooms, engine room, machine and blacksmith shops of the Rock River Machine Co., Janesville, Wis., was destroyed by fire Feb. 18, causing a damage of $8,000.

The foundry of the Gould Coupler Co., Depew, N. Y., was destroyed by fire, Feb. 18; loss $40,000. The plant will be rebuilt.

The repair and machine shops of the Fifth Ave. branch of the Brooklyn Elevated railroad were destroyed by fire Feb. 20. Loss on building, machinery and cars, $200,000.

Fire did $2,500 damage to the pattern shop of the Racine Boat Mfg. Co., Racine, Wis., last week.

At Massillon, O., Feb. 18, the foundry of A. Heiman & Bro., was burned; loss $20,000. The Dauntless Burner Mfg. Co.'s plant was also destroyed with $8,000 loss.

New Construction:—

Williams, White & Co., of Moline, Ill., will add a new machine shop to its plant which will be 240 feet long and 112 feet wide.

The Wireton Iron & Boiler Works, of Blue Island, Ill., will relocate at Hammond Ind., and will erect a new boiler plant at a cost of $10,000.

The plant of the Savage Arms Co., Utica, N. Y., will be considerably increased in size by the addition of several buildings.

The Toledo Tube Co., of Toledo, O., will erect an addition

to its plant within a few months. Some time ago the manufacture of tubing was abandoned and the manufacture of shovels was made a specialty. So large has the shovel business grown that it is necessary to increase the size of the plant as nearly double the output is required to satisfy the demand.

The National Wire Corporation of New Haven, Conn., has purchased considerable land during the past two weeks upon which additions to the plant will be located.

At Chicago, Ill., the city authorities are considering the erection of a municipal foundry for the purpose of manufacturing all the castings required by the city. It is doubtful if the scheme will go through.

The Elmira Rolling Mill Co., of Elmira, N. Y., has been incorporated with $100,000 capital for the purpose of rolling merchant bars. The old plant of the Elmira Machine & Foundry Co. has been purchased and a merchant mill will be installed. M. H. Arnot, James B. Rathbone, E. E. Buchanan, John Brand, I. D. Booth, F. B. Darby, D. E. Rice, N. D. Doxcy, E. G. Herendeen, L. R. Johnson and J. H. Johnson are the incorporators.

The Marietta Sheet Steel & Tin Co., of Marietta, O., projected by L. C. Taylor, of Cambridge, O., intends the erection of a tin plate and sheet steel plant at East Norwood, a portion of Marietta. The plant will contain four hot mills and will cost about $150,000. According to a contract entered into with the Marietta Board of Trade a certain number of lots are to be sold near the site of the new plant before the erection of the plant is begun.

The Norwalk Steel & Iron Co., Norwalk, O., has awarded contracts for the erection of its crucible steel plant. When completed the plant will contain one 36-pot furnace which will later be increased by a furnace of the same capacity. An open-hearth furnace of 15 tons capacity will also be installed. The contract for the buildings was awarded to the Fort Pitt Bridge Co., of Pittsburg. The main building will be 100 x 460 feet, while the boiler house will be 37.5 x 60 feet and the gas producer house 37.5 x 115 feet. Hyde Bros., of Pittsburg, received the contract for the installation of the boiler plant of 1,000-h. p. capacity. The contract for the cranes was awarded to the Niles Tool Works, while Bement Niles & Co. have the contract for five steam hammers. The Northern Electric Co. will have the installation of the generators. The Pittsburg Feed Water Heater Co., of Pittsburg, was awarded the contract for the erection of a feed water heater plant with a capacity of 1,250-h. p. Contracts for the rolling mills and additional machinery will be let shortly. The plant will be placed in operation about July 1.

The Ferris Clevis Co., Oshkosh, Wis., will build a foundry to cost about $15,000.

A contract has been let by Williams, White & Co., Moline, Ill., to the Kenwood Bridge Co., of Chicago, for the steel construction of its proposed machine shop. It will be 112x240 feet, one story in height with a high center span and galleries along the sides, and will be equipped with the most improved machinery. An electric light and power plant and a new crane are under consideration.

Work has commenced on an addition to the Berlin Machine Works, at Beloit, Wis. The new structure will be used as a machine shop and will be one story high, 200x200 feet. The company expects to occupy the building about April 15. The approximate cost of the building, electric cranes and dynamos, etc., is estimated at $100,000. The company has prepared plans for the erection of a large foundry on the south end of their lot.

The foundation for the additions to the Wheeling & Lake Erie Railroad Shops, at Norwalk, O., is under construction. The new building will be 90x214 feet and 26 feet high. The blacksmith shop will be 90x54 feet; the boiler shop 104x90; the remaining 56 feet of the addition and all of the building now in use as a blacksmith shop will be employed as a machine shop, leaving the present machine shop exclusively for pit and gang work. The boiler shop will be equipped with two new boilers and an engine and the company will put in a 60-foot transfer table to facilitate the placing of locomotives on the machine shop tracks. Some $65,000 worth of new machinery will be bought.

It is reported that Eastern capital will be put into a new foundry at Stockton, Cal., to manufacture mining machinery.

The Southern Car & Foundry Co., operating car works at Anniston and Gadsden, Ala., and Memphis, Tenn., has again started on the erection of a car plant at Wylam, near Ensley, Ala. The company has been given an order for the Norfolk & Western Railroad Co. for 1,000, 80,000-pound capacity, box cars, and now has orders on its books for 5,675 cars. The railroads of the country will pay some $6,000,000 for the work the company now has under contract, and over $4,000,000 worth has been contracted since January, 1902. This means continuous work during the whole year for 1,000 employes.

The Buckeye Engine Co., Salem, O., will erect a modern pattern building.

The work of constructing the brick building in Elkton, Md., along the line of the Philadelphia, Wilmington & Baltimore Railroad for the Powers Foundry Co. is nearly completed. The company will employ double the number of men after it moves into the new building. James F. Powers, formerly of Baltimore, is president of the company.

The Duquesne Steel Foundry Co. has purchased for $45,000 a property at Coraopolis for a manufacturing site.

The plant of the Penobscot Machine Co., Bangor, Me., is to be enlarged by the addition of some 4,000 feet of floor space.

The Pittsburg District:—

The Standard Steel Car Co. of Pittsburg placed an order with the Shaw Electric Crane Co. of Muskegon, Wis., for 14 electric traveling cranes for installation in their new plant near Beaver, Pa. The cranes will be of 7½ tons capacity each.

The McKees Rocks Manufacturing & Foundry Co. of McKees Rocks, Pa., is being organized for the purpose of building and operating a plant for the manufacture of a hoisting jack of a new design. The nominal capitalization will be $50,000. John P. Pastre, James A. Harr, C. W. Stoup and J. E. Digby are the incorporators. Mr. Pastre, who is at present president of the Anderson-Dupuy mill of the Crucible Steel Co. of America, will be president of the new company.

The Bradley Manufacturing Co. of Pittsburg placed a contract with C. H. Bradley & Co., Jr., engineers, for the construction of three buildings in Allegheny to comprise their new engine building plant. The main building will be 380x35 feet, while a power plant and pattern shop will also be erected. The new company will manufacture the Willans central valve engine which is especially adapted for electric light purposes. The Bradley Manufacturing Co. was lately organized with a capital of $200,000. The president is D. J. Geary, a manufacturer of boilers, at Oil City; vice-president, C. H. Bradley, Jr., Pittsburg; secretary and treasurer, J. H. Bailey, Pittsburg.

The Keystone Bronze Co., 38th Street and A. V. R. R., Pittsburg, will erect an addition to its foundry 50x120 feet in size.

The Kidd Brothers & Burgher Steel Co. recently decided to change the name of the concern to the Vulcan Crucible Steel Co. The organization of the company remains unchanged. The company is erecting a new plant at Aliquippa, Pa., and the entire 90 pots will be in operation by April 1. The officers of the company are W. S. Kidd, president; J. B. Graham, treasurer; S. G. Stafford, secretary; and S. Sutherland, manager of works.

The Prentiss Tool & Supply Co. of Pittsburg has applied for a Pennsylvania charter with a capital of $25,000. J. E. Bissell, H. Prentiss and John J. Sorber are the incorporators. The company conducts a machinery supply house at 120-122 First Av., and has constantly on hand a large line of lathes, drills and machine tools, together with a stock of all kinds of second-hand machinery.

The Pittsburg Railways Co. last week placed an order with the Providence Engineering Co. of Providence, R. I., for six Rice-Sargent engines whose capacity will aggregate 20,000 h. p. The Babcock-Wilcox Co., of New York, was awarded the contract for boilers aggregating 10,000 h. p. capacity.

The Pittsburg & Lake Erie Railroad Co. will spend more than $200,000 for machinery for equipping its new plant to be erected at McKees Rocks. The machinery will include wheel lathes, boring mills, tire setting appliances, pneumatic riveting machinery, planers, shapers and drills. There will also be a foundry where brake shoes will be cast.

The Pittsburg Stove & Range Co., of Allegheny, Pa., has

made arrangements to centralize its nine foundries now located in the Pittsburg district at Beaver Falls, Pa., where a site of 23 acres has been secured. A large stove foundry will be erected on this site, employing when fully completed from 800 to 1,000 molders. The plants that will be abandoned are as follows: Anshutz, Bradberry & Co., DeHaven & Co., Crea, Graham & Co., Bissell & Co., and F. & L. Voegtly located in Allegheny; A. Bradley & Co., Pittsburg; Graff & Co., Monongahela, Pa., Walters, Walker & Co., Sharpesburg, and Baldwin & Graham, New Castle, Pa.

The plant of the Homestead Valve Co., Pittsburg, will be removed from the present quarters, 107 Wood street, to Homestead, Pa., on April 1.

At a meeting of the directors of the National Bridge Co., of Pittsburg, held last week officers were elected as follows: E. M. Schofield, president; W. N. Conger, vice-president; C. F. Blackman, secretary and treasurer. After April 1, the offices will be located in the Arnott building. The plant will be erected at Colonia, Pa.

J. L. Lewis, of the Lewis Foundry & Machine Co., Pittsburg, has purchased a tract of 40 acres at Coraopolis, Pa., in the vicinity of the company's plant. The property will be cut up into lots and improved with houses for the men employed at the plant.

T. H. Bakewell, secretary of the Duquesne Foundry Co., Pittsburg, has purchased a large tract of land adjoining the company's plant at Coraopolis which will be used later for an extension to the plant.

The Oliver Iron & Steel Co., Pittsburg, will erect two new bolt factories adjoining its plant on the South Side at a cost of about $20,000.

A special meeting of the stockholders of the Follansbee Bros. Co., Pittsburg, will be held on April 21, for the purpose of voting upon a proposition to increase the capitalization from $300,000 to $800,000. The increase in the capital is to provide funds for the erection of a four mill tin plate plant and a four mill sheet plant. The location of the plant has not yet been determined upon.

The Pittsburg Construction & Engineering Co., of Pittsburg, has commenced the erection of a new plant at 27th St. and Liberty Av. The building will be 271 x 100 feet. The company makes a specialty of installing and repairing everything electrical.

The Hussey-Binns Shovel Co., of Pittsburg, will apply for a charter on March 11. The incorporation will be merely a formal affair. E. B. Alsop, G. V. Wilson, R. H. Binns, E. H. Binns and J. U. Hussey are the incorporators.

The American Steel Co, of Pittsburg, has been organized and will apply for a Pennsylvania charter on March 5. Eugene S. Reilly, M. B. Kelley and P. D. Reilly are the incorporators. The company will engage in the steel brokerage business and have opened offices in the Park building.

The U. Baird Machinery Co., of Pittsburg, dealers in all kinds of machine tools, has been reorganized under the name of the Baird Machinery Co., of Pittsburg, with a nominal capitalization of $1,000. H. A. Reed, C. A. Wolf and W. B. Wolf are the incorporators.

General Industrial Notes:—

The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., has purchased the Caskey Bros. Brass Foundry, together with 20 lots for $35,000. The foundry which has been closed for a year, will be opened immediately and employ 150 men.

The new plant of the New Castle Forge & Bolt Co., New Castle, Pa., was placed in part operation last week. The boiler and structural rivet department was placed in full operation and orders on hand will insure its full operation for several months. When in full operation the plant will turn out a full line of boiler and structural rivets, bolts, hot-pressed nuts, forgings for car and agricultural works and all grades of chain from 3-16 to 1 inch in size. The main building of the plant is 250x60 feet with a power plant 65x35 feet. The erection of the plant was commenced less than 60 days ago and the installation of machinery is nearly completed. The fast erection of this plant is phenomenal at this time when all kinds of erection is badly delayed on account of the scarcity of material. The company was only recently organized with a capital of $75,000. Frank Ryman, formerly superintendent of the South Side plant, Pittsburg, of the Oliver Iron & Steel Co., is president of the company and manager of the plant. J. N. Norman, secretary; A. B. Whieldon, treasurer, and W. H. Cox, vice-president. The entire plant will be in operation within 30 days, when prompt deliveries can be made on all products manufactured.

The Shelby Steel Tube Co. has placed the new bar mill at its Greenville, Pa., plant in operation. It will break down blooms into billets for piercing and rolling purposes.

The report printed in Pittsburg last week to the effect that the Carnegie Steel Co. has leased the plant of the Tidewater Steel Co. at Chester, Pa., is officially denied. What gave rise to the report is the arrangement in force between the Carnegie Steel Co. and an angle mill in Chester, whereby the Carnegie interests secure angles from this mill on a conversion arrangement, as stated in our Pittsburg market letter last week.

At a meeting of the officials of the American Steel & Wire Co. to be held shortly, the question of consolidating the Beaver Falls, the Salem, O., and the New Castle, Pa., plants will be discussed. It is altogether probable that the Beaver Falls and Salem plants will be dismantled and the machinery removed to New Castle. Both the Salem and Beaver Falls plants are located at considerable distances from their source of raw supply and it is for this reason and the concentration policy entered upon by the United States Steel Corporation that the two mills are to be dismantled.

The National Malleable Casting Co. has awarded the contract for the erection of an addition to its steel casting plant at Sharon, Pa., to the American Bridge Co.

The new foundry and novelty plant of Lamb Bros., South Sioux City, Ia., was placed in operation last week.

The new plant of the Carnahan Stamping & Enameling Co., Canton, O., was placed in operation last week. The tin can department will have a daily output of 60,000 cans when in full operation.

At the annual meeting of the stockholders of the Dauntless Manufacturing Co., of Beaver Dam, Wis., held last week the name of the company was changed to The Malleable Iron Range Co., and the capital stock was increased from $65,000 to $100,000.

The wages of the puddlers of the Altoona Iron Co., Altoona, Pa., have been increased from $4.50 to $4.75 per ton.

The 16-inch mill at the Danville, Pa., plant of the Reading Iron Co., was successfully placed in operation last week. The plant was destroyed by fire about nine months ago. The 20-inch skelp mill will be placed in operation shortly.

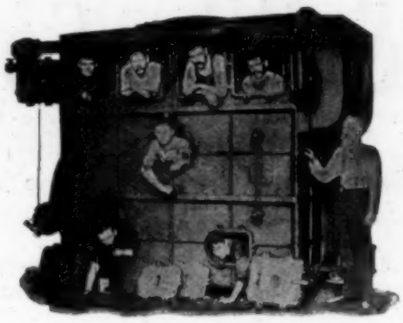
The new foundry and enameling plant of the J. M. Kohler Sons Co., Sheboygan Falls, Wis., was placed in operation last week. The owners of this plant were formerly associated with the Kohler, Hayssen & Stehn Mfg. Co., whose plant was destroyed about a year ago. Later the concern was dissolved and the Kohlers organized the company which bears their name. The foundry is 70x340 feet; power house, 40x70 feet; enameling room, 70x240 feet; mill room, two stories, 60x100 feet; warehouse, two stories, 60x200 feet; store shed, 70x100 feet.

The steel plant of the National Steel Co., at New Castle, Pa., was shut down last week for an indefinite period to undergo repairs. When they are completed the output of the plant will be practically doubled, as the present converters are to be replaced by converters of twice their capacity.

The Sheffield Stove Works, Nashville, Ky., have resumed operations after an idleness of 30 days for enlarging the plant and the adoption of patterns for new lines of stoves and ranges.

Negotiations are reported under way for a consolidation of edged tool companies with a capitalization of $25,000,000. The new corporation is planned for the extension of the export business. Among the concerns that are counted upon to figure in the deal are the Fayette R. Plumb Co., Philadelphia; the American Axe & Tool Co., with factories in Pittsburg, Beaver Falls and Lewiston, Pa., and Jamestown, N. Y.; the Kelly Axe Mfg. Co., at Alexandria, Ind.; the Warren Axe & Tool Co., Warren, Pa.; the United States Edged Tool Co., Cataraugus, N. Y.; the Standard Axe Co., Pa.; the Mann Edged Tool Co., Lewiston, Pa.; James H. Mann & Co., New York; Romer Axe Co., Dunkirk, N. Y.

The Biggs Boiler Works, Akron, O., have increased their capital from $15,000 to $75,000.



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If you are interested in the subject of feed-water heaters, we would be glad to hear from you.

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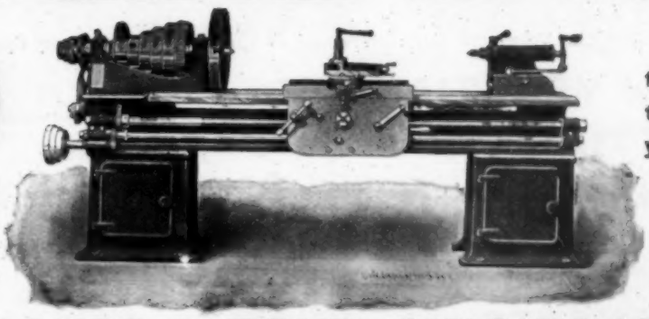

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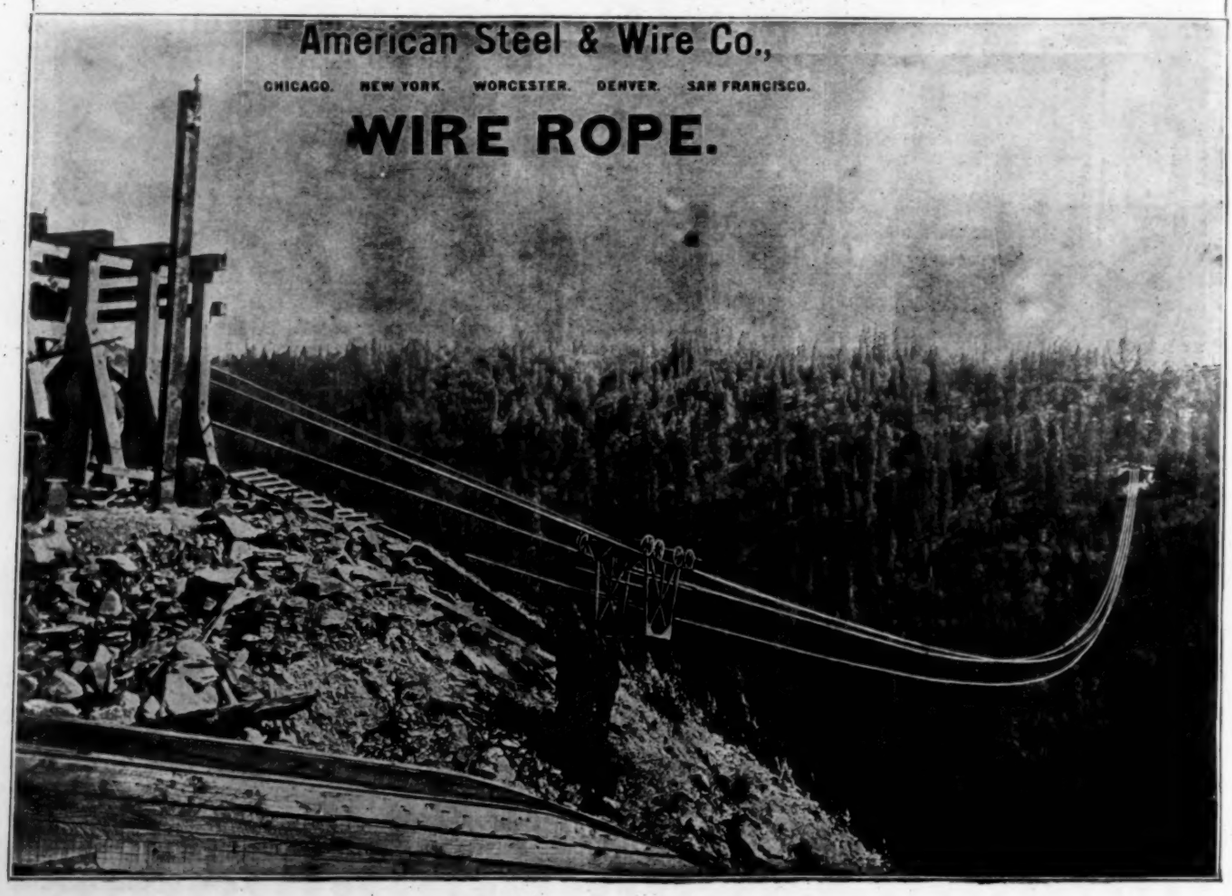

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UP-TO-DATE MANUFACTURERS realize this and are equipping their mills with our machinery, paying the extra price. You had better look into this matter—it may save you dollars. Shall be pleased to hear from you.

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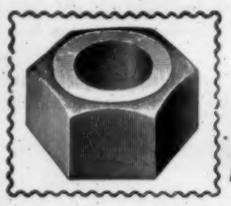

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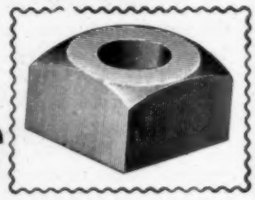

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The following are the contents of a recent issue of **The Foundry:**

Trade Outlook.
A Modern Foundry. Illustrated.
Convention of A. F. A.
Kranks' Korner.
A Cneek Without Bars or Gaggers. Illustrated. Richard Barnett.
Repeat Castings. Illustrated. George Buchanan.
Name Plates. Edmund S. Sperry.
Newton Cupola. Illustrated.
Sly Water Mill Illustrated.
Construction and Management of Cupolas. Thos. D. West.
What Will Make Iron Wear? W. Osborne.
Good Thing for Bench Molders. Illustrated.
Why Foundries Lack Competent Foremen. Wm. H. King.
Anthracite Coal as Cupola Fuel. T. F. Stimpson.
Delano Pulley Molding Machine. Illustrated.
Among the Foundries.
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